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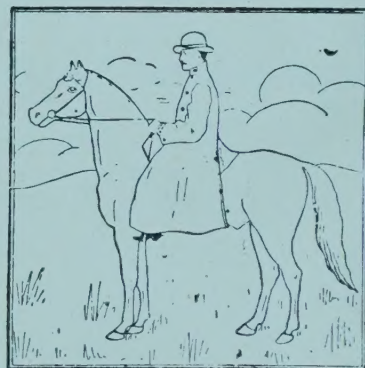
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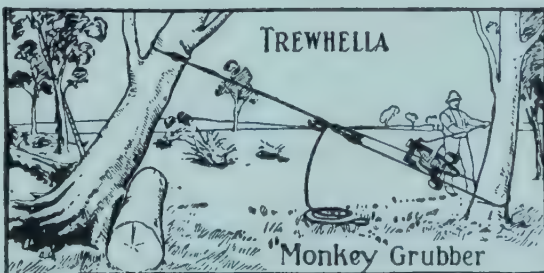
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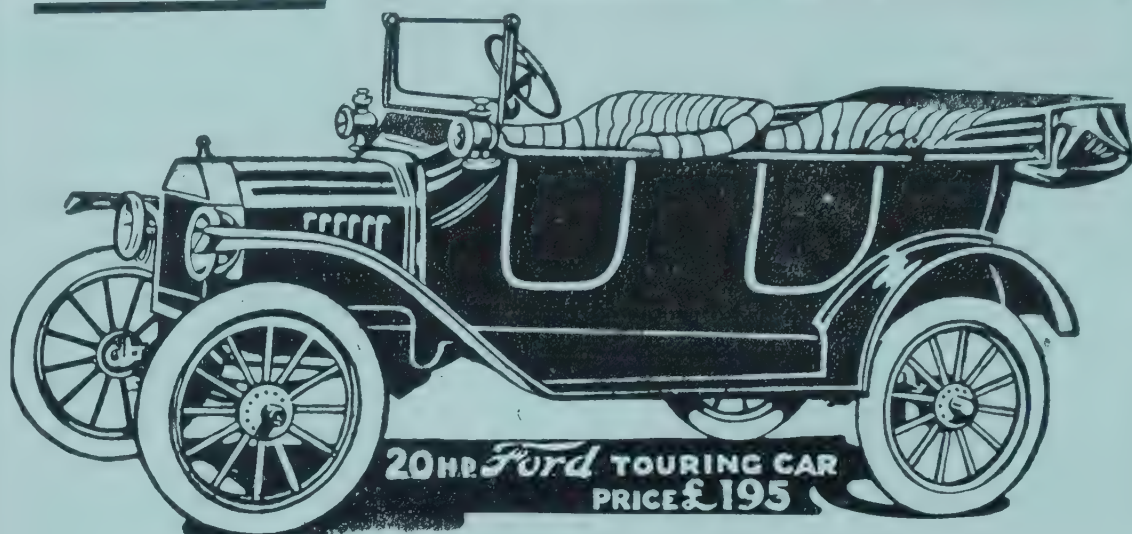
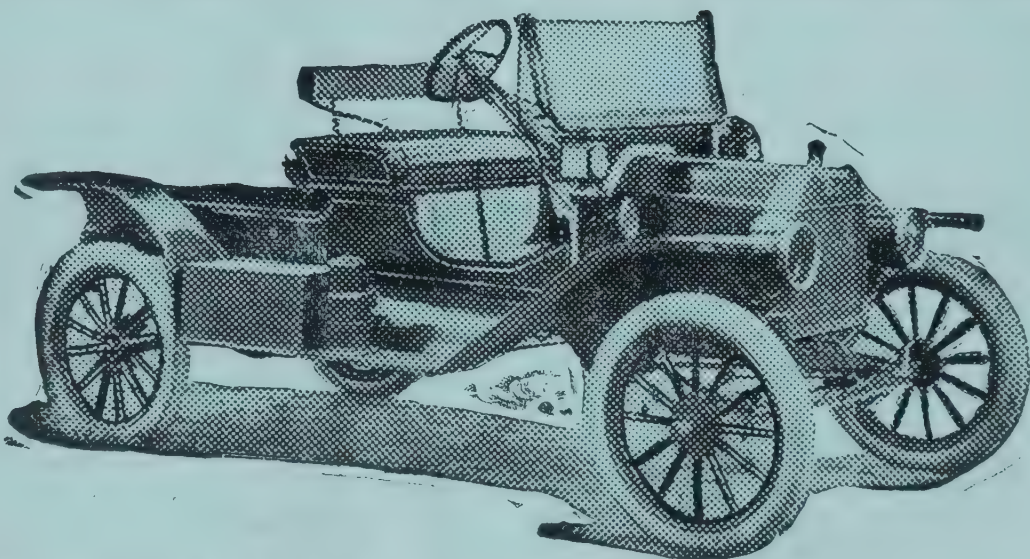
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QUEENSLAND AGRICULTURAL JOURNAL

VOL. IV.

JULY, 1915.

PART 1.

Agriculture.

THE INFLUENCE OF AGRICULTURAL CONFERENCES ON FARM LIFE.

By THE EDITOR.

One of the great advantages which the farmer has over all other workers is the healthfulness of his occupation. His work may be, and undoubtedly is, hard; but if he would pause to think of his surroundings, of his conditions of life, and of the wide and promising field which it opens to him for scientific research—if he would recognise that his is a vast and elevated arena in which he may exercise his mental as well as his bodily powers—if he would see that his art or profession is one in which distinction and honour are to be attained, even more worthily than by the more mentally laborious, learned, and other professions—then would he realise that his life and profession are things in which he may justly rejoice.

He stands before the world as a public benefactor, in the generality of cases, however, without being conscious of the fact. Farming is the only business in the world in which the man who can beat his neighbours in his results, produce better crops, and surround himself with greater comforts, becomes a public benefactor. This is clearly enough to be proved. The tradesman who gets up in the world, does so at the expense of his customers and of his brother traders. He makes money, if successful, by what are called smart business strokes, but successful dealing does not constitute him a public benefactor, rather the reverse, and his methods are of no importance or value to anyone but himself. No one is the richer for his exertions but himself, but many are poorer.

The farmer, on the other hand, cannot, even if he wished to do so, hide the secrets of his success. All his work is open to the world to criticise and emulate or to improve on. Has he succeeded in producing the two proverbial blades of grass, he does not keep his methods to himself, but he calls his friends and neighbours together to rejoice with him over his success, and to show them how they may go and do likewise. The way in which he sets about the tilling of his land, the treatment of his stock, the seasons at which he sows, plants, and reaps, the manner in which he stores and markets his produce, are all open secrets, which he gladly imparts to his neighbours. Not content with his immediate friends, he does what he can to spread his superior knowledge throughout the country, and in no better manner does he do this than by attending agricultural meetings and conferences, where he either speaks or reads papers on subjects with which he is better acquainted than others.

We are led to these remarks by considering the work done at the several Conferences held in the past, where some 150 of the most intelligent and highly trained planters, farmers, orchardists, and dairymen have given Australia the benefit of their ripe experience and of the experience of those who sent them to the Conference to represent them. These hundred and odd delegates were exponents of the views of probably a hundred thousand people engaged in rural occupations. Their papers and speeches, and the animated discussions thereon, will be read by many hundreds of thousands of agriculturists, fruit-growers, planters, and others, not only throughout Australasia, but almost over the civilised world; for the *Queensland Agricultural Journal*, in which the proceedings of the Conferences were published, finds its way from Queensland to the outside four-fifths of the world. We merely mention this to show that the farmers, so far from hiding their light under a bushel, as tradespeople do with the secrets of trade, blazon forth their successes equally with their failures, and thus, as we have said, become public benefactors. Their success in life has this to still further sweeten it: It has not been the result of grinding the life out of others, it has caused no single heartache to unfortunate debtors, but has been hardily earned and honestly gained, and everyone round these captains in the ranks of practical farmers is, or ought to be, the richer for the example they furnish, while no one is made poorer by their success.

The Annual Conferences, which were held alternately at the various centres of the agricultural industry, exercised a most beneficent influence upon the various branches of agricultural science. During the course of the year, new discoveries, new inventions, new plants, and new methods come thick and fast; and what time so well chosen to propagate all new ideas as the week of the Agricultural Conference, where men are gathered together from the four corners of Queensland, intent upon giving and receiving those new ideas?

Our forefathers, even in this fertile land, have reaped the fruits of the virgin soil with scanty appliances and little experience in farming. The rich soil bountifully responded to the most barbarous methods of cultivation. But they have left us, as an inheritance, the duty of restoring the land to its original fertility. How are we to do it? It must

be accomplished by thorough cultivation, subsoiling, drainage, irrigation, and the liberal use of farmyard manure and artificial fertilisers. The modern farmer must, and usually does, discard all antiquated machinery and implements—he casts to the winds many time-honoured fallacious theories. He makes horse, wind, water, and steam do the work our forbears did with their hands. This gives him time to improve his mind by studying modern agricultural literature. It is no longer necessary for him to work sixteen hours a day to “get there.” If we reflect on the extent to which we old farmers in the sixties taxed our young muscles at the expense of our brains, the wonder is that we are as intelligent as we are. But for this we have to thank agricultural shows and conferences. There we have tardily learned the lessons by which our sons are now profiting. It cannot be gainsaid that the dull, plodding, hard-labour farmer, who has no time to read, who begins his laborious day tired, and ends it worn out with fatigue, cannot nowadays become a successful farmer. He must blend exercise of the muscles with exercise of the mind. There are no problems in the exact sciences, no questions of law, no intricacies of engineering, so difficult as the problems presented by nature to the farmer. He has to grapple with exhausted soils, insect pests, the vicissitudes of the seasons, with storms, floods, and droughts, with diseases of various animals, with low prices, and short crops. In fact, the whole powers of Nature are alternately arrayed against him, and he must overcome these or go under. Here, then, he has scope for exercising all the faculties of his mind and body, and he has to call to his aid the botanist, the entomologist, the geologist, the chemist, and a host of others expert in some one particular branch of science on which the operations of the farmer depend. By their aid and the exercise of his mental powers, he is enabled successfully to combat and check injurious agencies, to retain and increase the fertility of his land, and to employ such machinery in his work as will leave him ample leisure to read and study the principles of what may be called the noblest and most useful of all professions—agriculture.

SCIENCE VERSUS ROUTINE.

“The genius of scientific progress, after creating miracles in the industrial domain, has at last seriously undertaken to demolish agricultural routine, that fortress behind which agriculturists have entrenched themselves, and where the deaf and blind will not hear nor see what is to their advantage, thus slowly, very slowly, has agriculture progressed in this age of gigantic strides and discoveries.” So wrote Eugene Lange some years ago in the “Official Journal of the Central Board of Agriculture of Trinidad.”

The last revelation will cause a revolution in agriculture. The worn-out soil of old Europe will become as productive, if not more so, than that of the Far West of America. The earth will lose its prestige—for there will be no difference between good and bad soil—since soil is not necessary to grow potatoes.

The eminent agronomist, Alfred Dudony, has succeeded in growing potatoes, most esculent, in wire baskets without a particle of earth. It is thus proved that eclosion, life, and prosperity of plants in general, and potatoes in particular, will not require them to bury their roots in the earth, since, with chemicals and scientific culture, they will be independent of soil.

Mr. George Ville having sown four grains of wheat on burnt sand, and watered them with some chemical solution, obtained, for every grain of seed, 20 grains of wheat with straw. The result of these experiments goes to show that the soil itself has no creative power or virtue. Its functions are to support vegetation, to store and distil, under the influence of light, heat, and electricity, the alimentary substances indispensable to the auto-creation, self-conservation, and automatic development of the organs and tissues of plants. The alimentary substances are known, have been counted and analysed. There are fourteen, not one more, not one less, asserts Mr. Emile Gautier. Organic substances: Carbon, hydrogen, oxygen, and azote. Mineral substances: Phosphorus, sulphur, chlorine, silicium, iron, manganese, calcium, magnesium, sodium, and potassium. These fourteen substances nourish all plants without distinction—the tiny grass as well as the giants of the forest—alimentary, venomous, tinctorial, gummy, oleaginous, resinous, textiles, flowers, fruits, &c. The differences are the result of variety of combinations of the primary substances that may be compared to the combination of the twenty-six letters of the alphabet, forming a variety of words.

Of these fourteen substances essential to the life of plants, 93 per cent. are supplied by the atmosphere. In presence of such facts, evidently mere routine will not give an equal result conducive to increased crops from a given acreage.

It is absolutely necessary that the agriculturist should know what relation there is between the plant he cultivates and the soil on which it is cultivated. Advanced scientific agriculture is possible only with the aid of scientists. But it is quite easy for the intelligent agriculturist to step aside from routine and cultivate properly and judiciously. The following approximative analysis, which can be made without apparatus or more than one chemical, will answer in most cases, and ensure better results than are now obtained by many agriculturists.

TO MAKE AN APPROXIMATE ANALYSIS OF SOIL.

1. Take a given quantity, free from stones or other foreign substances.
2. Dry it perfectly.
3. Take 1 lb. of the soil so prepared, burn it to a red heat; weigh. The difference from the original weight will register the amount of humus.
4. Cool down; then pour on it three times its volume of rain water. Stir with care and subside. Next evaporate the water. Its residue will show the soluble salts.
5. What is now left to experiment upon is pure mineral earth. Pour on it some water, stir well and treat with nitric or muriatic acid

until no effervescence is notable. Then drain, dry, and weigh. The difference from the last obtained weight will register the calcareous part.

6. Dry what earth is left, wash it freely, allowing the water to escape slowly. Continue doing so as long as the water is coloured. Then dry and weigh, and you will have the arenaceous (sandy) portion. The result of these operations will give the proportional composition of the soil experimented on.

COMPLETE FERTILISERS FOR FARM, ORCHARD, AND VEGETABLE GARDEN.

From Mr. J. C. Brünnich's work on the application of artificial fertilisers in order to increase the productiveness of the soil, we select the following formulæ for mixed fertilisers suitable for various crops:—

FARM AND GARDEN.

ASPARAGUS.

This plant requires a friable, well-trenched loam, rich in humus.

Heavy dressings of well-rotted stable manure, half-decayed leaves and straw, bones, &c., should be well incorporated with the soil.

The value of the stable manure is greatly increased by the addition of—

2½ cwt. bonemeal	}	per acre.
2½ cwt. superphosphate		
1 cwt. sulphate of potash		
2 cwt. nitrolim		

or the same quantities in pounds—viz.—

2½ lb. each of bonemeal and superphosphate
1 lb. sulphate of potash; and
2 cwt. nitrolim

for every 43 square yards of ground.

A good sprinkling with common salt when preparing the bed gives often good results.

When the shoots begin to appear, a dressing with 1 cwt. of nitrate of lime per acre, or 1 lb. per 43 square yards, can be applied to great advantage.

Asparagus is one of the few plants which likes chlorine (a constituent of common salt and of muriatic acid); and, therefore, in the above formula 1 cwt. of muriate of potash may be used instead of the sulphate.

BEANS.

Beans grow well on almost any soil, but prefer a well-drained clayey loam. Like all leguminous crops, beans require lime, and the soil should contain a fair amount of this plant food. Apply per acre, according to the quality of soil—

2 to 3 cwt. of superphosphate;
¾ to 1½ cwt. of sulphate of potash;
None to ½ cwt. of nitrolim (or dried blood).

When the beans are grown to be eaten green, the amount of nitrogenous manure can be considerably increased by using 1 cwt. of nitrate of lime, applied in three or four portions as topdressing.

For use in garden, apply—

6 lb. superphosphate,
2 lb. sulphate of potash,
 $\frac{1}{2}$ lb. nitrolim,

and three topdressings of $\frac{1}{2}$ lb. of nitrate of lime to every 43 square yards.

BEETS AND BEETROOTS.

Beets prefer a fairly rich sandy loam, but will do well on almost any soil, as long as it is not stiff and clayey. Well-rotted farmyard manure should be applied some time before sowing, and the following artificial fertiliser mixture used when thinning out or transplanting:—

2 to 3 cwt. superphosphate	} per acre,
$\frac{3}{4}$ to 1 cwt. sulphate of potash	
$1\frac{1}{2}$ to 2 cwt. nitrolim or sulphate of ammonia	

followed by a topdressing with 1 to 2 cwt. nitrate of lime about a month later. The sulphate of potash may be with advantage replaced by muriate of potash, or, when the sulphate is used, a dressing of common salt will be found beneficial.

Should the beet be grown without a previous application of farmyard manure, the quantity of artificial fertiliser must be increased, using—

4 to 6 cwt. superphosphate	} per acre,
$1\frac{1}{2}$ to 3 cwt. sulphate of potash	
2 to 3 cwt. of nitrolim	

when planting, followed by a topdressing of 1 to 2 cwt. nitrate of lime.

In a garden use—

6 lb. of superphosphate,
2 lb. of sulphate of potash,
3 lb. of nitrolim or sulphate of ammonia

for every 43 square yards of ground, followed by a topdressing with 1 to 2 lb. of nitrate of lime.

CABBAGES.

Cabbages may be grown in almost any part of Queensland under certain conditions, but naturally do best in the colder district. Rich, mellow soil, containing plenty of humus, and an abundant supply of water are required. From 10 to 15 tons of well-rotted farmyard manure per acre, or from 2 to 3 cwt. to every 43 square yards, should be applied when the ground is being prepared. At the time of planting apply—

$\frac{1}{2}$ to $1\frac{1}{2}$ cwt. of sulphate of potash	} per acre.
4 to 6 cwt. of superphosphate	
2 to 3 cwt. of nitrolim or sulphate of ammonia	

and about a month later a topdressing of 3 cwt. of nitrate of lime. A second topdressing with 1 cwt. of nitrate of lime, when cabbages begin to heart, is very beneficial.

The same amounts of fertilisers in pounds should be applied in a garden to every 43 square yards, or, as large cabbages should be planted about 3 feet between rows, to every row 43 yards long.

Should no or only a small amount of farmyard manure be available, the amount of nitrogenous manure should be increased by at least one-half.

Commercial mixed fertilisers, containing, besides water-soluble phosphoric acid, 3 to 4 per cent. of nitrogen, and about 2 per cent. of potash, may be used in quantities from 3 to 4 cwt. per acre at the time of planting, a second dressing of 2 to 3 cwt. about a month later, and a third dressing of 1 to 2 cwt. when hearts begin to form.

(To be continued.)

PROSPECTIVE POTASH RELIEF.

The "London Public Ledger" recently published the following notes on the question of potash supplies from the "New York Oil, Paint, and Drug Reporter." As the matter is one of great importance to our readers on all sides, we have pleasure in reprinting same, in the hope that it may enable them to obtain any supplies of complete manures that they may need for the coming season more easily than seemed likely without the modifications mentioned by our New York contemporary. If the United Kingdom has permitted the export of cacao to help her colonies and allies, no doubt a way will be found to do the same with potash. According to the "New York Reporter"—

"The week's developments in the potash situation, reflecting the influence of the German embargo upon exports from the country, have been in some respects of a more reassuring character, and, while further advances have been made in some of the salts in the local market, a more reasonable spirit seems to have dominated late trading. In several important instances of embargoes by the foreign Governments affecting the "Reporter's" interests, substantial modifications and concessions have been made, and members of the local trade most directly concerned in the potash restriction have not hesitated to express their confidence that some means will be found within reasonable time, operating to relieve the harsh and unqualifying force of the German decree. Within the last few days has been received from our Berlin consul a cablegram signifying that the German Government has been brought fully to the realisation of the serious loss in revenue and incidentally the hardship that would inevitably follow the absolute restriction upon potash exports. This message voiced the willingness of the German authorities to modify the embargo in its most vital effect—namely, to permit the shipment of potash from the country only after it had been subject to such a denaturing process as would limit the product's consumption strictly to the field of fertilisers. This limitation bears out the force of the argument generally advanced here to justify Germany's action, that it was prompted chiefly to check its possible use in the manufacture of munitions of war by belligerent countries.

“The proposal to denature potash so that it would be incapable of entering any service outside the fertiliser field has attracted widespread interest and comment throughout the local trade, where the subject has been recognised as one of novel and more or less perplexing possibilities. There has apparently never been an occasion before to resort to any means to divert potash from its natural properties, and by what chemical agents this change in its character can be effected, what transformation may be involved in the methods of manufacture in which potash enters as a basic material, or by what processes the fundamental properties can be recovered, are among the problems to confront our importing and consuming interests if this denaturation scheme is carried out. It has been suggested that a sulphating basis might be tried to restrict potash to its most peaceful service, as this method would be simplest and easiest to fulfil the purpose intended. German chemical science has worked out many more intricate questions, and if there may be any sincerity in the desire of the German authorities to satisfy the agricultural needs of the neutral countries, we may feel a reasonable degree of confidence in our share of potash shipments for service in the coming season. Manufacturers of chemical compounds in which potash cannot be replaced may find the question of prospective supplies less hopeful of solution. When the new conditions which they may have to meet are known it will be a keen test of wits in which our ingenuity and adaptability must play their best rôles. The question has been raised in local quarters as to whether there had been any real foundation for the presumption that our imports of potash were being employed in any service detrimental to German interests, since our needs of the material for the usual peaceful arts and manufactures have been so urgent during the last few months as to make any ulterior use an economic perversion.

“The subject of a more capable development of our potash resources has naturally commanded more serious study since the announcement of the German export embargo. The latest advices leave us in apparently the same state of hopelessness as ever. Prospects for bringing the production at Lake Searles, in Southern California, to a commercial realisation now seem to have had little more than a fantastic foundation.”
—“Tropical Life.”

SEED SUPPLY FOR 1916.

By F. F. COLEMAN, Department of Agriculture and Stock.

Owing to the certain scarcity caused by the war, it is of the utmost importance that seed merchants in Queensland make early arrangements for their next season's supply of vegetable and flower seeds; and those who are in the position to import their own supplies would do well to at once get into correspondence with English firms of repute.

It will be a satisfaction to loyal Queenslanders to know that vegetable, flower, and farm root seeds are grown in the South of England on a large scale, many varieties of both vegetable and flower seeds being exported to the Continent and to the United States of America, some of which reach Australia after two profits have been made on them.

Even aster, ten-week stock, and many other choice flower seeds can be grown to advantage in Essex, where most leading houses have seed farms. Turnip, cabbage, beet, mangel, swede, rape, &c., are grown to advantage in both Kent and Essex, and from there exported all over the world. Cheaper seeds may in some instances be obtained, but better it is impossible to procure; the thing is to get these supplies to Australia, at first cost.

Such seeds as cauliflower are grown in Italy, near Naples, and merchants who require large quantities could purchase direct; but for orders of, say, 28 lb. of a variety, London still offers the best market, as the buyer has the assurance that the large firm from whom he purchases has inspected the growing crop, and is satisfied that it is true to name, and free from sports.

Pictorial flower and vegetable seed packets are printed on a large scale in England. Horticultural sundries, such as flower sticks, wooden labels, &c., can also be purchased in London, of better quality, and at lower prices than is often charged by Continental houses.

Any of the firms mentioned below are open to quote for leading varieties at prices that will bear favourable comparison to those that the trade have been in the habit of paying, but it is as well to note that seed catalogues are printed for sending out to all purchasers, and *genuine seed merchants* who send a detail list of quantities and sorts required can obtain *much better terms*:—

Messrs. Cooper, Taber, and Co., Seed Growers and Merchants, 90 Southwark street, London, S.E.—Large growers of cabbage, beet, mangel, turnip, and general vegetable and flower seeds.

Messrs. Hurst and Son, Seed Merchants, 152 Houndsditch, London, E.—General vegetable and flower seeds, farm root seeds, grasses, &c., and sundries.

Messrs. Watkins and Simpson, Seed Merchants, 12 Tavistock street, Covent Garden, London, W.C.—English flower and vegetable seeds.

Messrs. Carter and Co., Seed Growers and Merchants, Raynes Park, London, S.W.—Vegetable and flower seeds. This firm is wholesale as well as retail.

Mr. William Deal, Seed Grower, Kelvedon, Essex—Large grower of vegetable, farm root, and flower seeds. (Large quantities only.)

Messrs. W. W. Johnson and Son, Ltd., Seed Merchants, Boston, Lincolnshire—Vegetable and farm root seeds.

Messrs. Chas. Sharpe and Co., Sleaford, Lincolnshire—Vegetable and farm root seeds.

Messrs. E. W. King and Co., Seed Growers, Coggeshall, Essex—Vegetable and flower seeds, mangels, swedes, &c.

Messrs. John K. King and Co., Seed Growers, Coggleshall, Essex—Vegetable and flower seeds, mangels, swedes, &c.

Messrs. Toogood and Sons, Seed Merchants, Southampton—Vegetable and flower seeds, mangels, swedes, &c.

Messrs. Blake and Mackenzie, Ltd., Printers, Islington, Liverpool
—Seed packets, pictorials, &c., and seedsmen's requisites.

Messrs. Corry and Co., Ltd., Horticultural Sundries Merchants,
Bedford Chambers, Covent Garden, London, W.C.—Wood
labels, flower sticks, and general sundries.

Mr. G. H. Richards, Sundries Merchant, 234 Borough High street,
London, S.E.—Sundries, sticks, labels, &c., &c.

Above are all English firms of high standing; there are, of course,
several others in the wholesale trade.

Messrs. Watson and Scully will be found good shipping agents, and
might give buyers the chance of sending several orders in one lot. Their
address is—90 Lower Thames street, London, E.C.

In writing to any of the above for prices, quantities, varieties, &c.,
should always be stated, as well as terms suggested by buyers; it would
also be as well to enclose copy of the "Pure Seed Regulations" to enable
the sellers to quote for such seeds as will, *on arrival*, comply with the Act.

The Department will at any time give any further information that
may be required.

The following are good seed firms in France, Holland, and Italy:—

French—Messrs. Vilmorin, Andrieux and Co., 4 Quai de la
Megisserie, Paris—Vegetable seeds and flower seeds.

Messrs. Dupanloup and Co., 14 Quai de la Megisserie, Paris—
Vegetable seeds and flower seeds.

Italian—Messrs. Damann and Co., San Giovanni à Teduccio,
Naples, Italy—Cauliflower and some flower seeds.

Dutch—Messrs. Sluis and Groot, Enkhuizen, Holland—Large
importers of Italian cauliflower seed.

MANURE FOR WHEAT.

The Agricultural Chemist, Mr. J. C. Brünnich, recommends an
application of a half to one cwt. of superphosphate per acre, and states
that the application of lime would improve the texture of a light, loamy,
slightly sandy soil, inclined to be somewhat cementy when dry, and
prevent cementing. Limestone screenings or crushed limestone, at the
rate of 1 ton per acre, should be used.

CHICORY NOTES.

Quantity of seed required per acre: For roots, from 1 to 1½ lb.;
for a green forage crop, from 10 to 12 lb.

Weight of seed per bushel	27 to 30 lb.
Seeds in 1 lb.	335,000
Weight of raw roots per bushel ..	40 lb.
Weight of kiln-dried sliced roots ..	30 lb.
Average produce of roots per acre	5 to 10 tons
Loss in weight by roasting ..	20 to 30 per cent.

Roots may be sliced in a turnip cutter.

Pastoral.

THE STOMACH-WORM IN SHEEP (*STRONGYLUS CONTORTUS*).

By W. G. BROWN, Sheep and Wool Expert, Department of Agriculture and Stock.

Taken as a whole, Queensland is singularly free from serious diseases in sheep as compared with other countries, and even with the other States of the Commonwealth. Those we have are, with one exception, parasitic diseases, the chief of which is stomach-worms. It is the object of this article to put some evidence before the sheep-farmers of the coastal areas which will show them that the only really serious drawback to their keeping sheep successfully is the presence of stomach-worms on much of the country east of the Dividing Range. If we can check or abolish this pest, then there is no country in Australasia where mutton, lamb, and wool can be grown more profitably. The worm is a pest elsewhere on areas such as the Darling Downs, Peak Downs, the Central District, as far west as Jericho, the Maranoa and Roma districts, and in the South of Queensland, as far west as the Warrego River, and the flock-owners are able to deal with it there. I have not the least doubt that it may be dealt with on the coast, for I have been doing so successfully since the end of last year.

All the professional evidence I have been able to find, bearing on this subject, agrees that the life-history of *Strongylus contortus* is known. That being so, we are a long way on the road to success in dealing with the pest. A short *résumé* of this evidence, and some conclusions which are obvious in the light of that knowledge, will help us to deal successfully with the problem in Queensland.

LIFE-HISTORY OF THE STOMACH-WORM.

According to the helminthologists* the female stomach-worms lay their eggs in the bowels. These eggs then pass out of the body in the droppings. They contain living embryos which undergo further development upon reaching moisture in sufficient quantities. The embryos moult three or four times after hatching, this process lasting from three days to four weeks, according as the warmth and humidity are greater or less. The worms then climb the stalks of grass, and await the coming of a suitable host—that is, a cud-chewing animal. The worms are swallowed with the grass, and these, in the process of digestion, make their way to the fourth stomach, there again to lay eggs which pass out in the droppings; and so on, until the host dies, or the worms are expelled. It is known that the young worm is easily killed by cold or dryness, but when it is in the ensheathed or final form it may live for months. It is the ensheathed form which, endowed with length of life, matures in the stomach, and produces eggs, after being taken up by the sheep.

* Helminthologist: One who is versed in the natural history of worms.—Ed.

METHODS OF DESTRUCTION OF WORMS.

All the authorities agree—and it is plain common sense to agree with them—that, as Dr. Theiler, of South Africa, points out, “so long as sheep graze over a pasture infected with stomach-worms, so long will they become reinfected, particularly when the climatic conditions—warmth and moisture—are favourable for their exit from the eggs and development to the unsheathed stage.”

There are three ways of clearing the pastures from worms—

1. Burning off grass at a suitable time.
2. Allowing the pastures to lie idle, as far as cattle, sheep, or goats are concerned, for twelve months.
3. Sowing salt at the rate of 5 cwt. per acre on the paddocks infested with worms. Salt is known to be deadly to parasites of all kinds.

All these methods have been tried in one part of the world or other, but only the first and second are practicable in our case.

With the plan of burning off, it is necessary that the holding be cut up into comparatively small areas, for it is seldom that a man can afford to burn off the whole of his grass at one time. It is necessary also, when a paddock has been burnt off, that sheep put into it should be thoroughly drenched. Ten acres is not too small an area where *Rhodes* and *Paspalum* are well established. Small paddocks are essential for other reasons, if success in fattening sheep be desired. Too many sheep-farmers in this State have their sheep in paddocks so big that the great bulk of the grass is destroyed by the sharp toes of the flocks, instead of being eaten.

As regards the plan of letting the paddocks lie idle, Dr. Theiler states—“The ensheathed form of the worm has been found alive six months and more after being deposited”; and further, he states, “that a field which has had no sheep, cattle, or goats in it for a year, will practically free itself of worms.”

Here again the advisability of small paddocks comes in. A farmer could very well spare, say, 25 to 50 acres in a year out of, say, 500 acres without seriously missing the grass. The paddocks, besides, could be still used to graze horses, without infecting them with stomach-worms. The net result of the above, then, is that it is useless, or comparatively so, to clean a pasture of worms if sheep containing worms be allowed to graze on these clean pastures. It is necessary therefore that, if possible, the worms be killed or expelled from sheep which are to be placed on clean areas of any kind. This conclusion leads up to the various remedies which are being used to expel or kill the stomach-worm in sheep.

TREATMENT OF SHEEP INFECTED WITH WORMS.

An illuminating article appeared in the “American Veterinary Review” for February, 1915, by Mr. I. F. Craig, M.A., M.R.C.V.S., on the “Use of Drugs in the Treatment of Disease caused by Nematode

Worms.” He treats on the parasites affecting horses, cattle, sheep, &c. I have extracted from that article a number of Mr. Craig’s conclusions *in re* sheep. He states—

“ The general symptoms associated with the presence of worms are unthriftiness, debility, and anæmia.” [To these may be added, as I find it in my experience, severe scouring in the early stages of the attack of worms in sheep.] “It is possible, too, that mechanical irritation may cause reflex nervous symptoms such as convulsions or epileptiform fits. These troubles may be caused by the actions of toxins formed by helminths (worms). The first object in all treatment of disease is in removing the cause; in this case, nematode (or round) worms. The removal of the worms is brought about by anthelmintics. Those usually employed are: Oil of turpentine, coal tar creosote, carbolic acid, lysol, empyreumatic oils,* naphtholin, thymol santonin, arsenious acid, potassium antimony tartrate, common salt, sulphate of copper, sulphate of iron, areca nut, male shield fern, chenopodium, pierate of potash, kamala, rousso, quassia, oil of cade, carbon disulphide, assa-foetida, eucalyptol, benzine, and pomegranate and pumpkin seeds.”

Mr. Craig dismisses many of these, mainly on the score of expense and general unreliability. He says—

“ When dealing with worms in the stomach or intestines, it is necessary to have these organs as empty as possible, by withholding water and food for from twelve to twenty-four hours, to allow the drug, without undue dilution to come into direct contact with the parasites.”

Mr. Craig states further: “ The second part of the treatment consists in counteracting the effect of the worms by a generous diet and a course of tonics. Some of the anthelmintics—such as arsenic and sulphate of iron—will act in this way.”

The use of arsenic has often been stigmatised by the proprietors of drenches which are professedly non-arsenical. All the evidence which comes to hand shows that the basis of all drenches must be arsenical. Here is Mr. Craig’s opinion—

“ One reason that the action of vermicides is not very certain, even in the *Strongylidæ* in the Caecum and the Colon, is that the agents given are partly absorbed before they reach these organs, and are very much diluted in the contents of such organs, which always contain a huge mass of ingesta, even after withholding fluids or food for many hours or days. Hence, arsenic in its solid form is more likely to exert a vermicidal effect upon the worms than some of the more soluble agents.”

This effect is in agreement with my experience. I have tried a number of specifics in the endeavour to find a really good vermicide, and have, as yet, not found one so good as the old arsenic and Epsom salts

* Empyreumatic: Having the taste or smell of burnt animal or vegetable substances.—Ed.



PLATE 1.—STRONGYLUS CONTORTUS. (The Twisted Stomach-worm.)

drench of our grandfathers. Since 1st January, 1915, I have drenched upwards of 25,000 sheep in all stages of infection and in many widely separated districts, and in small lots of not more than 2,000 sheep, and have found that, at the least, the sheep have been prevented from dying through worms.

Some more of Mr. Craig's notes are worthy of reproduction. He says—

“To be of service, anthelmintics (drenches) must be used before acute symptoms set in, or the disease far advanced.”

This is really good advice. It is useless to wait until the sheep begin to die before being treated. The signs always appear long before the stage is reached when a good drench is as likely to kill as cure.

“Worms do not multiply indefinitely in the host. The multiplication is outside principally. It is in the young animals grazing on infected pastures that the *Strongylus* cause so much loss. Lambs from three months to nine months old are especially liable.”

This is borne out in Australia. In my experience, most of the big losses due to worms have occurred in lambs. It is wise, therefore, to drench lambs, especially weaners, whether they show signs of worms or not—that is, of course, on infected country.

In next month's Journal will appear some of the results of Dr. Theiler's very exhaustive experiments in South Africa, with a short *résumé* of his conclusions. The whole article appeared in the “South African Agricultural Journal” for October, 1912.

[TO BE CONTINUED.]

DESCRIPTION OF PLATE.

STRONGYLUS CONTORTUS.

FIG. 1.—Adult female magnified six times: *a*, head; *b*, ovaries wound around intestines; *d*, papillæ.

FIG. 2.—Adult male magnified six times.

FIG. 3.—Head: *a*, two-barbed papillæ.

FIG. 4.—Eggs highly magnified: *a*, *b*, *c*, *d*, *e*, *f*, *g*, *h*, different stages of development; *i*, egg as it is laid.

FIG. 5.—Skin showing nine of eighteen longitudinal lines.

FIG. 6.—Portion of female: *a*, intestines; *b*, *b*, end of ovary.

FIG. 7.—Caudal end of female: *a*, vulva; *b*, *c*, vagina; *d*, *d*, uteri filled with eggs; *e*, oviduct; *f*, *f*, ovary; *g* intestines.

FIG. 8.—Spicula, enlarged.

FIG. 9.—Bursa expanded to show costæ.

FIG. 10.—Group of males and females; natural size.

FIG. 11.—Caudal end of male: *a*, bursa; *b*, spicula; *c*, seminal reservoir; *d*, intestine.

SETTLERS' FLOCKS ON COASTAL LANDS.

By J. P. CHISHOLM.

It is clear to me that every coast settler should have some sheep—if not for money-making, then from a living standpoint for household meat supply. The matter needs small consideration; the gain is apparent. Fifty ewes well kept will produce fifty lambs, and a wool clip annually. All the ewes may not bear lambs, but some bear twins and others breed twice in twelve months. Fifty lambs a year means a meat supply for a settlers' home—a sheep a week. Ewes not bearing lambs will be good meat—40 lb. to 50 lb. of it, at a cost of, say, 10s. for the sheep (less value of skin), equal to about 2d. for the meat. Skin values vary on the growth of wool. I have before me account sales of skins to 8s. 6d. each. Estimating the yearly increase at fifty lambs from fifty ewes is taking a minimum. With moderately good management, even the worst kind of ewes would do better, and with Lincolns, Shropshire, or more particularly Dorsets, so famous for twins and triplets, a larger increase could be reckoned on.

I may here emphasise my opinion, based on the observations of many years—it is, that the merino sheep is not suitable for coast lands of Queensland and will fail. I refer only to the low coastal belt of country. Anywhere up “on top,” I think the merino may do fairly, and the drier the country, in moderation, the better they do; although I doubt if any country is too dry for merinos, so long as there is feed of some kind. They do well on the Lower Murray, in South Australia, on a 7-in. rainfall; and as good a small flock as one could wish for was to be seen in the driest interior, at Bedouri, and for all I know may be there yet. However, I would say—leave the merino to the dry lands.

My experience is with Shrops., Lincolns, Romneys, Dorsets, and, latterly, Border Leicesters. We live 200 miles from the sea, in a 22-in. rainfall in level country. For twenty years breeding sheep have gone from here to all parts of the coast of North Queensland—Mackay, the islands off Bowen, Proserpine, Ayr, the Herbert, and Johnstone Rivers, to Cairns, and many lots to Atherton district. In all the districts I have mentioned, sheep thrive, and, moreover, they thrive in many instances under adverse circumstances due to careless keeping, and in some instances to criminal cruelty and (from a good sheep man's view point) neglect. I know small flocks on the coast lands, unshorn through the seedy period, soiled, with dags hanging to them, and long-tailed unmarked lambs a year old running with their dams. All this, coupled with a total disregard of breeding, and, worse and unkindest of all, often driven into wet yards at night, and often crowded, and yet, despite all this terrible treatment, the sheep are all right. Is any better evidence wanted? Under such conditions, can it be wondered at that merino sheep got footrot and other ailments, and failed?

Most of the coast flocks of my acquaintance are jumble bred of all British breeds, Shrop., Lincoln, and Romney. Our flock here is the same—5,000 to 6,000—a jumble of British breeds. This is not coast country, but it is seedy country. I am often asked why I neglect

particular breeds, I reply that I have my own breed, "Plains sheep," and I show wool returns—once in the last seven years, so low as 10½d. per lb. but all other years up and over 1s., and last year reaching 13¾d. for thirty bales out of seventy-four bales, and at that sale (14th May) not only topping North Queensland, but coming within three of the whole State. I only mention these wool prices as showing that any type of sheep yielding good wool and mutton is a good breed. I give it as my opinion that a combination of breeds produces a sheep more suitable to coastal Queensland than any one particular breed. I mean, so far as my observations go.

Referring to the coast flocks, I have given attention at all times to the health of the sheep, and I have not seen them affected by worms or footrot; and, given freedom from disease, it may be taken for granted the constitution is good. Evidencing this, some seven years ago I bought a small flock of 185, of ill-treated sheep in wet country, near the mouth of the Burdekin River, within a few miles of the sea shore. They had been neglected for years, and I brought them home here, and let them go in the paddocks. A risky thing to do, you may say. It proves my confidence in the soundness of coastal bred sheep. Although that is seven years ago there are many of those sheep here now, and some must be twelve years old. They have been good breeders ever since. There is more Lincoln merino in them than any other breed.

Once the keeping of sheep on coast lands—or any lands except open downs—is mentioned, the reply comes with little variation, "Grass seed will kill them." The fact is, that, given proper management, the vilest black spear grass is harmless to sheep. Here in our paddocks we have miles of the worst grass seed country. The remedy is simple. It is to close shear your sheep just when the grass seed begins to shed, and once or twice in the month or six weeks of the venomous seed period after shearing give the flock a swim through a clean dip or a clear waterhole. I would emphasise the need to have the sheep closely shorn, by machine. It pays every small flock owner to have one of these little hand-turned shearing machines at a cost, I think, of about £3, although the labour of turning is heavier than in the picture.

Close shearing is necessary. The black spear grass seed has a tail that propels the point, and if the tail finds no wool to give it resistance, then the seed simply falls out again, but if odd seeds stick, and get a footing, the swim softens the seed, and the point comes out.

I have often wondered at the good health of sheep when fairly pierced all over with grass seed, and I have often swum woolly sheep, and so saved them, through a bad seedy period. If some seed does get hold in the shorn skin, the growth of wool soon lifts it out, and as the season progresses it dries in the tip, and falls off, leaving the wool clean. In the north the seeding period invariably begins in April, and lasts at the most two months.

As to the period of lambing, the natural time annually is August or September, or may be as late as October. This is all good, as the lambs will be shorn with the flock. Woolly lambs through a seedy period means

dead lambs, but when close shorn they come through unharmed if given the swim once or twice whilst the seed is shedding.

Very often the cry of "worms" is raised when coast sheep are spoken of. I reply that I have not found worms that ordinary care will not combat. Salt, and occasionally some sulphate of iron in the same trough, should always be before coast sheep, and they will soon take a lick of molasses; and even if worms did give trouble, small flocks are easily handled, and dosed, if necessary, in an hour.

An essential to the well doing of sheep is dry foot room to camp, a ridge for choice, and the top of the ridge. Room enough to be comfortable, freedom from noises, more especially the bark of dogs, is necessary for sheep if you would have them do well, and above all quiet handling—no yapping or chasing, but all the time gentle walking and quiet movement; and with that you can take sheep anywhere. In this connection I shall tell a story. A drover camped in cattle country in a dry time with old ewes, shepherded for many months, lost a bunch of 120, and they were not missed. They turned up, however, at a cattle station homestead, thirty miles to the east. In time the drover missed them, and made east in his search. He inquired at the cattle station. "Yes," they said, "the sheep were about here for days."

"Well," said the drover, "you might have known they belonged to somebody, and have put them in the yard."

"We tried to," said the cattle man. "We tried twice, and had everybody on the place out, and dogs besides, and the sheep were too wild. We couldn't yard them."

The case was too bad for words, and the drover went on his way. Here, however, is an illustration of what ill management will do. These old ewes were as quiet as household pets, and a child could have yarded them, anywhere, but the yapping and running, and the dogs, made them unworkable.

It is advisable in all flocks to mark lambs young. The nearer to fourteen days old when marked the better sheep.

A point in sheep keeping is the remembrance of the old adage, "A sheep loveth a short bite," and so it is advisable to put them on to pasture fed down by big stock, or on to burnt country, and if their area is not too large they will keep it down to suit themselves, because they know what is good for them, and will avoid long grass if practicable. Very much of the coast land is good pasture, and in wet times grass grows rapidly, and a home-flock of sheep could be kept on a very small area. I mean, say, five sheep to the acre, so long as the grass is growing, but sheep like a change. They get "paddock stale" and love a scamper round. The heavy wet season weather of the north is bad for sheep carrying much wool, and as the rainy period is January, February, and March, when the sheep are carrying their wool, it is one of the misfortunes of the business. If you have a shed, put the sheep under it on very wet days. Of course, open wool sheep, like Lincoln or Leicester, suffer very little inconvenience from rain, whereas denser woolled sheep would take days to dry; in fact, through a normal wet season anywhere

north of Mackay, they would be wet for months. Hence the need for open wool flocks. Yet the sheltering shed is a small matter; a roof 20 ft. by 12 ft. would easily give comfort to the home flock in heavy wet periods. In the wettest districts of England, where there are more wet days than on Johnstone River, sheep are kept everywhere and without shelter; but there the rain falls mostly in drizzle, and the fleece sheds it, whereas our heavy rainfalls would penetrate and make any fleece sodden. Keeping sheep, and in fact doing many other things in our North country, it is better to produce stock to suit the climate, than expect the climate to suit the stock.

And, moreover, few settlers realise their ideals, the pictures always being a little the best, but yet with ordinary care and management one may get very near perfection, near enough to make comfortable livings from a very small flock of the right sheep.

Concluding, I would say that if more information is wanted by any settler contemplating starting a flock, I shall be pleased to help all I can.

The Plains, Prairie, North Queensland,
1st June, 1915.

[The above corroborates, in the main, the advice given by Mr. W. G. Brown, Instructor in Sheep and Wool, to settlers on the coast, as to the suitability of the coast lands for certain classes of sheep.—Ed. "Q.A.J."]

WHAT IS A HOGGET?

Two graziers in a railway carriage are conversing on market prospects, and one remarks that he expects to get a good figure for his hoggets. When they had left the train, one of the remaining occupants asked his neighbour, "What's a hogget?" "Well, I don't know exactly," was the reply, "but I think it has something to do with a pony when its mane is cropped." "Not at all," interjects the other, "a hogget is a young pig." A new passenger comes in, and it is resolved to leave it to him. "A hogget?" sagely replies the newcomer, "well, you'll have to excuse me, gentlemen, because I really don't know anything about poultry."

What, then, is a hogget? An old cutting from the "Stock and Station Journal" supplies the answer. This is in the form of a letter to the editor and is as follows:—

"SIR,—Someone having asked in the 'Stock Journal' 'What is a hogget?' you say that the editor of the 'Queensland Grazier' says that 'a young sheep is a hogget until its first fleece has been shorn, and after that operation it's a hogget no longer, but some other kind of sheep.'

"According to his definition, a lamb shorn when, say, four months old could never become a hogget. And if it were never shorn, it would remain a hogget all its life. Perhaps he means that the first fleece is a hogget. But that can hardly be the case, because there would be such a wide difference between a fleece taken from a five-months-old lamb and another taken from a sheep eighteen months old, that the same name could not cover both.

“Now, I am going to give you my definition of a hogget. And to start with, I must confess my ignorance as to the literal meaning of the word ‘hogget.’ But by custom it means (in Australia) a particular kind of sheep. It does not apply to any particular breed or condition, but to ‘age.’

“A sheep when born is called a lamb, when weaned, a weaner. A weaner and a lamb, too, at the same time, whether shorn or not. And it is called a lamb until it begins to lose its first teeth, no matter whether it be weaned or shorn, or both, or neither. When its first two permanent teeth begin to show, it is a hogget. When it gets four teeth, it is no longer a hogget. Hence a hogget is a two-tooth, and a two-tooth is a hogget, shorn or unshorn.

“Still, I ‘may’ be wrong after over thirty years’ experience among sheep.”

An English dictionary defines a hogget as a two-year-old sheep. In the woollen manufacturing trade, hog fleece, hog wool is described in “Goodechild’s Technological Dictionary” as the first shorn fleece of a young sheep. In his work on “Wool,” A. Hawkesworth, woolclasser to the Sydney Technological Museum, in 1891, gives “teg,” “hog,” or “hogget” wool as the first fleece from a sheep that has not been shorn as a lamb, and “shurled hogget” as the first fleece from a sheep after it has been shorn as a lamb.—Ed. “Q.A.J.”

THE NUBIAN GOAT.

This animal in colour is black or tan, or a mixture of the two colours, either predominating. The bucks are hornless, and do not have that disagreeable odour which the common buck is distinguished for. In size they are almost as large again as the common goat, and are recognised as the best milkers of any class of goats known, yielding from 4 to 6 quarts a day, and are very docile. They are natives of the State of Nubia, in Egypt, of which State Khartoum is the chief centre. They do not like the cold. Fanciers have tried to acclimatise them in England, but with poor results. In this connection, they should do well in Queensland, as the climate is so mild.

Goats do not contract tuberculosis, thereby the necessity for boiling the milk is eliminated; and when milk is boiled it is also spoiled, for the reason that boiling or scalding changes the composition and also makes it indigestible. It is obvious that goat’s milk is highly desirable for children. The milk is very easily digested, even by the most delicate child or invalid. The reason for this is, that the butter-fat is in such minute particles—so small, in fact, that the cream cannot be separated. The butter-fat is all through the milk—*i.e.*, better held in suspension than cow’s milk, from which, if left standing, the cream comes to the top.

In England, Europe, and America the milch goat is given the prominence that the animal deserves. Here, in Australia, they are mostly despised, through a lamentable lack of knowledge regarding their value.

The illustrations are taken from Bryan Hook's work on "Milch Goats and their Management."

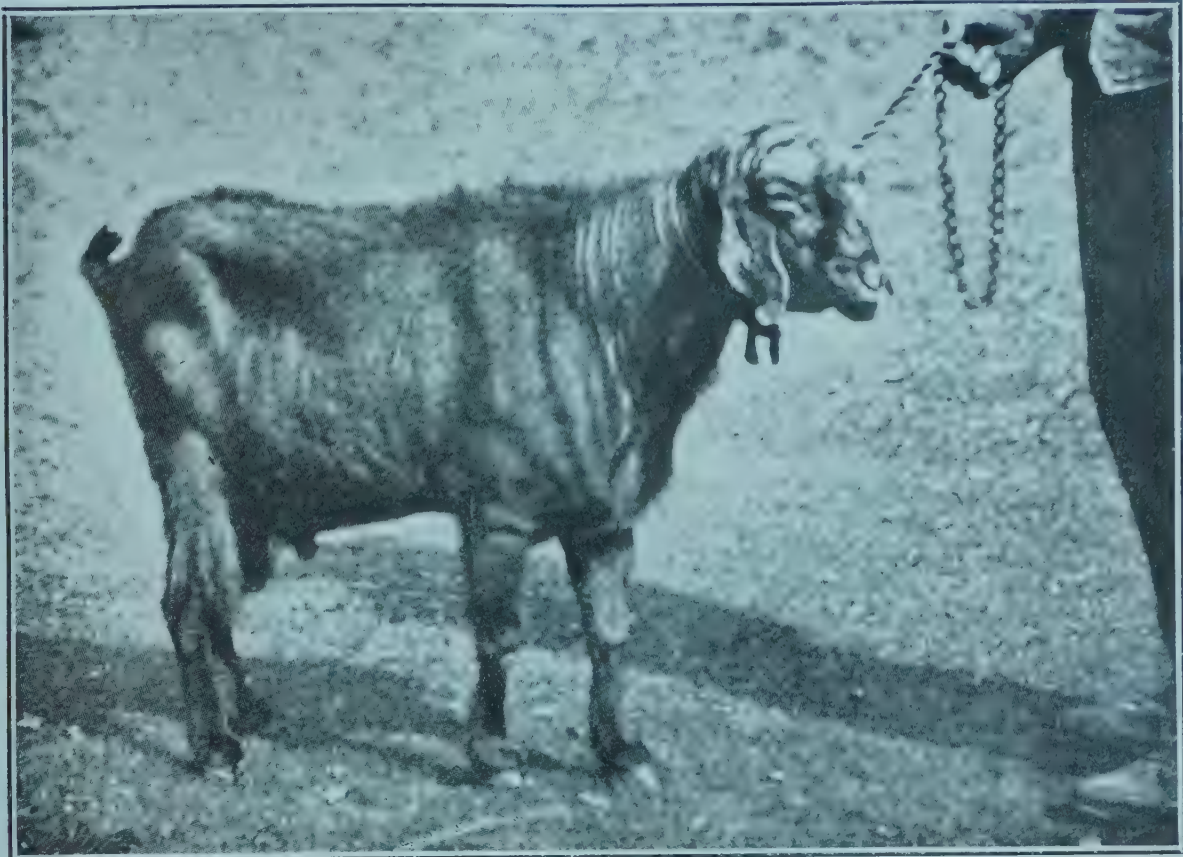


PLATE 2.—IMPORTED NUBIAN STUD GOAT, ALI BABA.

ABOUT MILCH GOATS.

In answer to many inquiries about the American Milch Goat Association, W. A. Shafor, Hamilton, Ohio, issued the following notice:—

More than twenty years ago an English writer said: "Much has been written and published on the advantage of goats' milk as a diet for young children and persons suffering from wasting diseases, consumption in particular, and many instances have been given in which lives have been saved by its use"; still this valuable article of diet, though better appreciated than it was twenty years ago, is a long way from holding the position it deserves in public estimation generally. A fact has, however been brought to light lately, the result of scientific investigation, which still further enhances the value of goats' milk, and that to an immeasurable degree—a fact that cannot be too widely known, and the importance of which cannot be over-estimated. The numerous inquiries that have been conducted of late years by scientists have elicited what is now pretty generally admitted by medical men—that tuberculosis can be, and is, communicated to human beings through the milk and flesh of cattle afflicted with that disease, the increase of consumption in children being largely attributed (according to Sir Lyon Playfair) to the use of tuberculosis milk. Now, when we consider, on the one hand, the terrible character of this insidious disease, and on the other hand the absolute necessity for the use of milk in the healthful rearing of children, such

a revelation is simply appalling. What makes matters worse, moreover, is that a cow may be suffering from the malady in its earlier stages without the disease being detected. For we are told that "there may be no appearance visible to the naked eye of the action of the tubercular bacillus in a particular animal, and yet it may not improbably be there."

"In view of such a state of things, who will not experience a sense of relief on hearing that goats' milk is entirely free from this element of danger? Professor Nocard states that out of over 130,000 goats and kids that are brought to Paris for slaughter at the shambles of La Villete every spring, the meat inspectors of that city have failed to discover a single case of phthisis. What is far more remarkable, however, he tells us that even inoculation fails to introduce the fatal bacillus into the system of the goat."

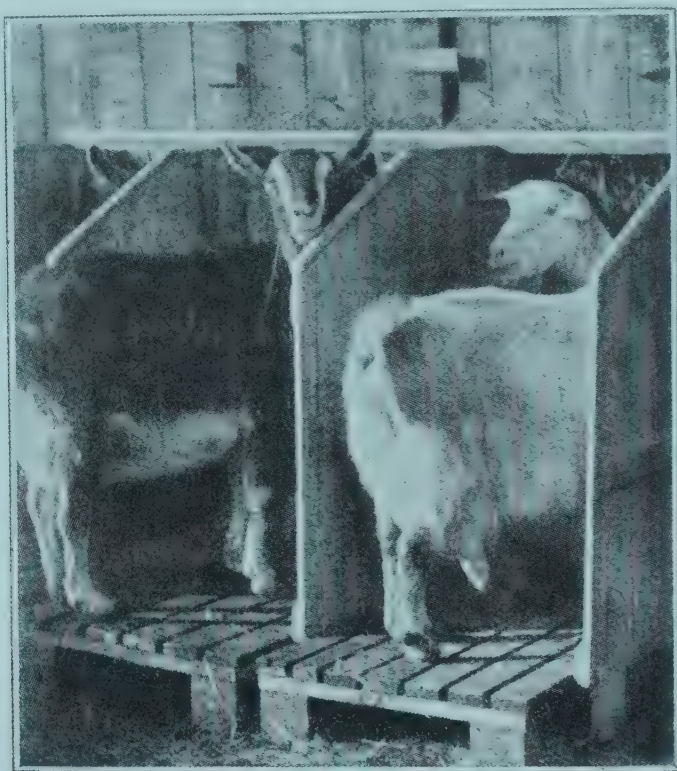


PLATE 3.—THE SAANDEN (SWISS) GOAT.

Another English writer says: "Goats' milk is a grand adjunct to the diet of those who are just beginning to regain strength after long severe illness. A diet consisting largely of goats' milk would restore many a convalescent far more speedily to health without the aid of drugs than anything I know of. A course of goats' milk may often be taken with advantage in the autumn by those who suffer much from cold during the winter months, but who do not care to take cod liver oil."

Many persons who, owing to their circumstances or surroundings, cannot keep a cow could well keep a goat. The first cost is very small, and any little outhouse with a tight roof and ventilated will accommodate it, and much of the waste that is now consigned to the garbage heap could be turned into pure, healthy milk if properly managed, for a goat will thrive where a cow would starve. Yet it must not be forgotten that with more room and greater variety of food better results may be obtained.

BORDER-LEICESTER SHEEP.

By P. R. GORDON.

The Border-Leicester Sheep has long been the favourite sheep in the South Island of New Zealand for crossing on the Merino and for the production of crossbred lambs for export. There are different opinions as to the early origin of the Border-Leicester breed, but the opinion most generally accepted is their being a direct offshoot from the Dishley Leicesters of Bakewell's time, further improved, or at least modified, in type on the Scottish border. What we are now accustomed to call Border-Leicesters are believed to have been taken north from Leicestershire about the year 1767 by the brothers Culley, who held the large farm of Wark and other belongings in Northumberland. No reliable information exists as to when the name Border-Leicester began to be applied to the breed, but no doubt it would be gradually adopted and used to distinguish them from the Leicestershire sheep. The Culeys were intimate friends and disciples of Bakewell, and after they had acquired the sheep naturally set about following the same lucrative enterprise as did their patron. Their sheep soon became known over large districts, and it is not difficult to imagine how the new name would gradually come into use and how it would be, to some extent, necessary to distinguish between them and the local Cheviot sheep as well as those of the parent stock of Leicestershire. These remarks will be followed much easier if it be at once noted that the type of Leicester raised by the Culley brothers was a modified type of the original Leicester, probably as much modified as to be qualified to establish a type of its own, even if left in its native home. The English Leicester of the present day and the Border-Leicester are, to a large extent, different animals. The former have the old characteristic tuft of wool on the forehead, wholly absent in the Border-Leicester. The English Leicester is also, as a rule, lower in the leg than his northern brother, and carries his mutton rather lower. There are also differences in style and coat. At the same time, there are sufficient resemblances between the two breeds to warrant the belief that they came originally from the same stock.

There has always prevailed a good deal of conjecture as to the methods of mating and crossing followed by Bakewell in the evolution of the great breed with which his name will ever be associated. There is just as much speculation *re* the methods of the Culeys. Some have maintained that they stuck pretty closely to the modified type of Leicester they took north to the Scottish border. Others have held that they utilised the Cheviot blood in addition. But the important, substantial fact is, that they succeeded in turning out a new race of sheep of great excellence, which, although no doubt altered to some extent in appearance since, still survive as a monument to their memory.

In 1790, it is reported that the Border-Leicester sheep at Mertown, in Roxburghshire, were even then of as high quality as those owned by the Culeys in Northumberland. No doubt they had been acquired, either from the Culeys or from the original source. Lord Polworth followed Bakewell's system of inbreeding to a great extent, and from the beginning of the last century no single sheep horn outside the

flock was used in it for fifty years. But whether the Cheviot played a part in the operations before that period is what a great many of the leading authorities find hard to disbelieve; in fact, many of them prefer to do so. It is generally understood that facility and success in crossing bears some analogy to common ancestry, as we see in Clydesdale and Shire crosses, but in subsequent operations even in those crosses themselves. Be the conjecture as it may, the breed has been sufficiently established to ensure its prepotency in the production of a prime all-round improver of other breeds, to an extent equalled by no other variety of sheep. In judging the breed, greater emphasis has always been put on the head, where one can best tell as to the character, constitution, and breeding of the animal. It should be carried above the line of the animal's back, the crown should be level, the eyes set well up, the face well filled and naturally arched to the muzzle. The jaws should be deep, the eyes bold and luminous, and the nostrils wide, the latter denoting strength and vigour. The colour should be white, but not pale, and a fleshy nose and pinky eyesetting are to be avoided, as suggesting delicacy and softness of constitution. The neck should be fairly strong and muscular, and in the ram slightly arched on top. A strong neck vein is also very important, and it should run naturally into the shoulders, which should be obliquely set to the body, as in the Aberdeen-Angus bull. The back of the sheep should be perfectly level and straight from neck to tail. The loins should be wide and firm to the touch, and the ribs round and wide, with the flesh well carried upon them. This formation has a tendency to make the animal look a trifle leggy or high-standing when shorn, but for a breed which is so largely used for crossing and putting mutton on other breeds it is a point of great importance. The wool should be long and soft and in little locks or curls—which is called "pioly." This "piol" is best seen in sheep which have been only a month or two dropped, the wool being in little clusters of ringlets all over the body. The belly of the sheep should be well covered, although plenty of outstanding sheep show a little openness below. Breeders, however, try to hide this defect as far as possible. With the head and ears, the legs of the sheep should be uniformly covered with nice short white hair. Over and above all, the typical Border-Leicester should have free and easy movement. A sheep may be ever so good under the hand, but unless he walks nicely and keeps his head well up, he has not the best indications of constitution and vigour. As it follows that, to walk well, a sheep must be well set on his legs; the legs should be clean, flat, and flinty, and the hocks naturally bent without being hooked. Above all, the backbone should only be felt through a thick pad of flesh.

What the Border-Leicester has done for the frozen meat trade in New Zealand would be hard to estimate. What they could do in a similar capacity in Queensland would be to speak of even better results. Whether in the production of fat lambs or as high-class wethers, suitable alike for the butcher and freezer, it would be impossible to speak too highly of them. Over a great part of Queensland the rainfall is uncertain, and good seasons do not always follow one another. In some of the other mutton breeds, if the lamb is lost to the freezer through a bad season it is little use as a wether. But the Border-Leicester is an exception, as he not only makes a good lamb in a good season, but if that fails he furnishes into a good wether even if he gets a check in his infancy.

There are in Queensland several who have adopted the Border-Leicester, including some who have had New Zealand experience of the breed.

Photos of a typical ram and ewe of this breed are here reproduced.

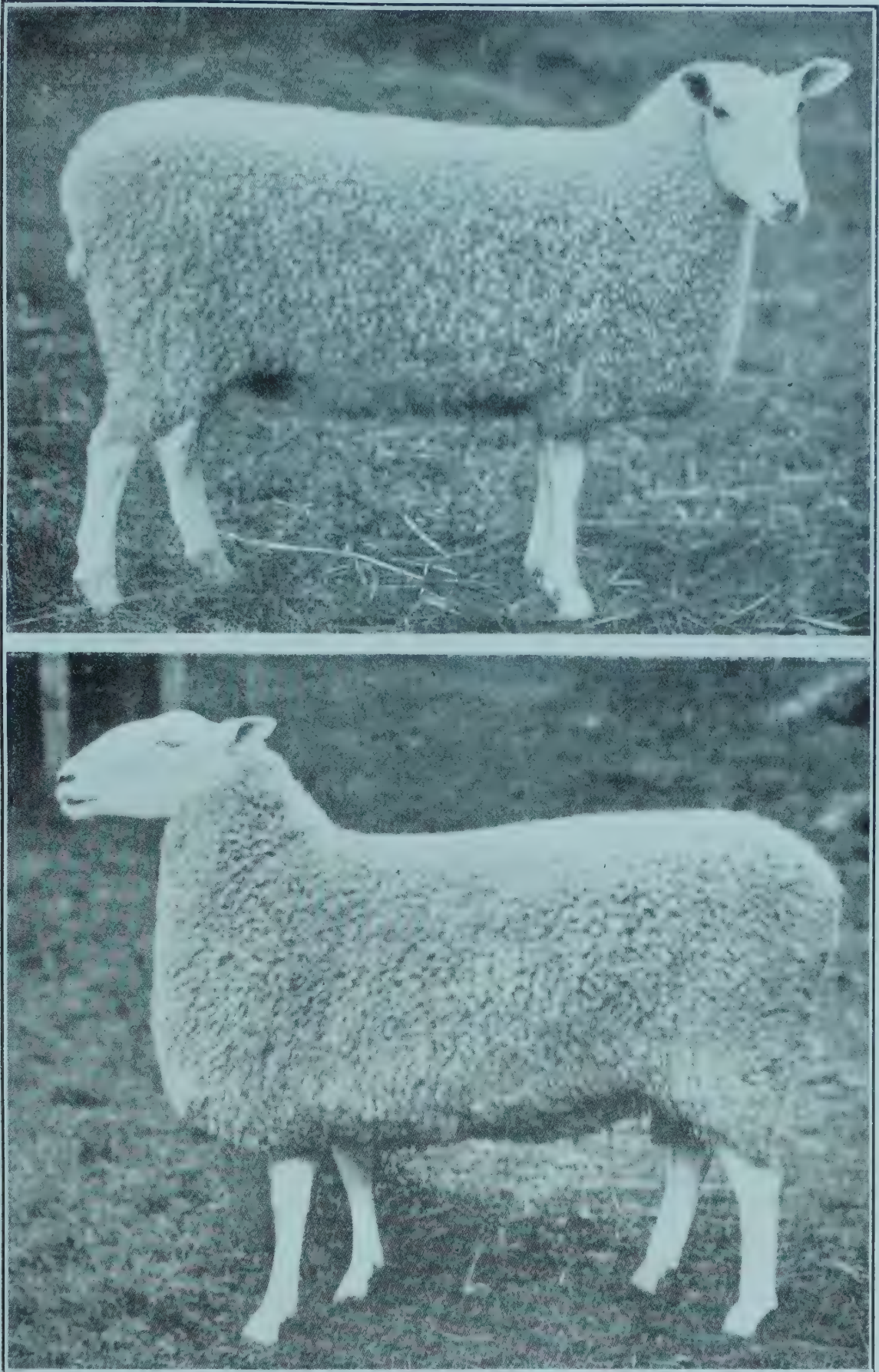


PLATE 4.—BORDER LEICESTER RAM AND EWE.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RECORDS OF COWS FOR MONTH OF MAY, 1915.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Noble Dot...	Jersey ...	2 May, 1915	666	4·7	36·89	In addition to grazing on natural grasses, the cows received a ration of ensilage throughout the month.
Iron Plate ...	" ...	21 Feb. "	485	5·6	32·11	
Netherton Belle	Ayrshire ...	23 April "	532	4·6	28·82	
Honeycomb	Shorthorn...	27 July, 1914	337	6·4	25·57	
Lady May ...	Ayrshire ...	7 Mar., 1915	707	3·1	25·54	
Thornton's Fairretta	Jersey ...	27 Mar. "	456	4·6	24·71	
Bella ..	Ayrshire ...	19 Jan. "	512	4·0	24·04	
Sweet Meadows	Jersey ...	28 July, 1914	276	7·2	23·62	
Nina ...	Shorthorn...	18 Feb., 1915	553	3·6	23·30	
Burton's Lily	" ...	17 Nov., 1914	427	4·6	23·14	
Madame Melba	Holstein ...	8 Sept. "	537	3·6	22·63	
Miss Jean ...	Ayrshire ...	24 Nov. "	382	4·9	22·07	
Lady Melba	Holstein ...	6 Mar. "	460	4·0	21·59	
Miss Melba	" ...	22 Nov. "	592	3·1	21·38	
Lady Loch II.	Ayrshire ...	8 Feb., 1915	431	4·2	21·26	
Violette's Peer's Girl	Jersey ...	22 Oct., 1914	293	6·0	20·80	
Lady Annette	Ayrshire ...	26 Dec. "	354	4·9	20·46	

SISAL HEMP.

From Messrs. Landauer and Co.'s (London) "Weekly Market Report," dated 21st April, 1915, we learn that during that month more imported quantities of Mexican sisal were allowed to be exported from Progreso (the Mexican port for shipment of sisal hemp), and American operators have been thus able to secure free supplies of this commodity. The price paid is understood to be in the neighbourhood of £25 to £26 per ton c.i.f. New York. Even at this figure, however, the article is of little interest to European buyers, for the reason of the fact that it is impossible to secure freight below £6 to £8 per ton. Meanwhile, values remain, for Mauritius hemp (*Furcraea*, which grows like a weed on waste land in many parts of Queensland from South to North), £33 to £34 for prime, and £31 to £32 for good fair.

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, MAY, 1915.

Four thousand and forty-nine eggs were laid during the month. Since the last report Mr. Parker's birds have had a slight attack of warts, and have in consequence fallen off in their laying. Several pens have an odd bird or two in moult, whilst there are five of Mr. Forsyth's, four of Mr. Gill's, and three of Mr. E. A. Smith's White Leghorns in trouble in this direction. A. H. Padman wins the monthly prize with 133 eggs. The following are the individual records:—

Competitors.	Breed.	May.	Total.
Mrs. J. Jobling, N.S.W.	Black Orpingtons	128	251
Jas. McKay	White Leghorns	109	231
C. B. Bertelsmaier, S.A.	Do.	100	217
A. H. Padman, S.A.	Do.	133	214
S. E. Sharpe	Do.	88	208
J. D. Nicholson, N.S.W.	Do.	106	208
J. Gosley	Do.	110	193
Mrs. Munro	Do.	110	192
A. W. Bailey	Do.	120	186
J. R. Wilson	Do.	100	185
T. Fanning	Do.	87	184
A. T. Coomber	Do.	84	171
C. Knoblauch	Do.	95	163
J. M. Manson	Do.	101	162
Dunheved Poultry Farm, Vic.	Do.	79	161
O.K. Poultry Yards	Do.	65	160
J. M. Manson	Black Orpingtons	94	160
C. F. Clark	White Leghorns	80	160
Kelvin Poultry Farm	Do.	114	157
R. Jobling, N.S.W.	S. L. Wyandottes	85	156
E. F. Dennis	White Leghorns	108	156
H. Harnill, N.S.W.	Do.	93	154
E. V. Bennett, S.A.	Do.	106	154
F. Clayton, N.S.W.	Do.	95	145
R. Jobling, N.S.W.	Do.	88	145
Cowan Bros., N.S.W.	Do.	84	137
W. Lyell	Do.	79	133
W. Purvis, S.A.	Do.	77	132
W. Parker	Do.	31	131
E. A. Smith	Do.	50	130
Derrylin Poultry Farm	Do.	78	127
J. Zahl	Do. (No. 2)	74	127
Moritz Bros., S.A.	Do.	63	119
E. Le Breton	Do.	97	119
W. Meneely	Black Orpingtons	72	111
T. Fanning	Do.	54	108
J. Aitcheson	White Leghorns	90	108
Cowan Bros., N.S.W.	Black Orpingtons	84	101
Geo. Tomlinson	White Leghorns	68	101
G. H. Turner	Do.	63	93
J. Zahl	Do. (No. 1)	57	91
R. Burns	S. L. Wyandottes	37	91
R. Burns	Black Orpingtons	49	86
E. Pocock	White Leghorns	52	83
J. H. Gill, Vic.	Do.	37	81

Competitors.	Breed.	May.	Total.
Loloma Poultry Farm, N.S.W. ...	Rhode Island Reds ...	47	73
W. Lindus, N.S.W. ...	White Leghorns ...	65	71
J. G. Richter ...	D. ...	48	56
E. A. Smith ...	Black Orpingtons ...	17	40
W. H. Forsyth, N.S.W. ...	White Leghorns ...	23	38
S. Chapman ...	Brown Leghorns ...	24	24
F. Clayton, N.S.W. ...	Rhode Island Reds ...	1	1
J. R. Johnston ...	Plymouth Rocks ...	0	0
Totals ...		4,049	6,985

Statistics.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF MAY IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING MAY, 1915 AND 1914, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	May.	No. of Years' Records.	May, 1915.	May, 1914.		May.	No. of Years' Records.	May, 1915.	May, 1914.
<i>North Coast.</i>	In.		In.	In.	<i>South Coast—continued:</i>	In.		In.	In.
Atherton ...	2.11	13	0.60	2.40	Nanango ...	1.70	27	0.74	1.39
Cairns ...	4.57	27	3.27	6.17	Rockhampton ...	1.70	27	0.84	Nil
Cardwell ...	3.69	27	0.47	6.20	Woodford ...	3.02	27	2.57	3.68
Cooktown ...	2.92	27	0.81	6.27	Yandina ...	4.85	21	3.69	7.91
Herberton ...	1.60	27	0.87	1.59					
Ingham ...	3.47	22	0.67	7.69	<i>Darling Downs.</i>				
Innisfail ...	13.25	27	6.74	15.76	Dalby ...	1.48	27	0.52	1.09
Mossman ...	2.10	5	0.59	5.41	Emu Vale ...	1.12	17	1.63	2.98
Townsville ...	1.46	30	0.36	0.60	Jimbour ...	1.41	24	0.53	1.08
<i>Central Coast.</i>					Miles ...	1.79	27	1.00	1.02
Ayr ...	1.22	27	0.34	0.39	Stanthorpe ...	1.75	27	2.64	3.81
Bowen ...	1.43	27	0.13	0.47	Toowoomba ...	2.27	27	2.24	3.82
Charters Towers ...	0.91	27	Nil	0.20	Warwick ...	1.61	27	4.00	3.93
Mackay ...	4.19	27	1.19	3.08					
Proserpine ...	6.11	11	1.25	4.06	<i>Maranoa.</i>				
St. Lawrence ...	1.97	27	0.86	0.28	Roma ...	1.51	25	1.43	1.18
<i>South Coast.</i>									
Biggenden ...	2.09	14	0.73	0.96	<i>State Farms, &c.</i>				
Bundaberg ...	2.93	27	1.82	0.96	Gatton College ...	1.96	14	1.96	2.25
Brisbane ...	2.97	64	2.48	3.60	Gindie ...	1.11	13	1.42	0.01
Childers ...	2.59	19	0.45	1.14	Kamerunga Nurs'y	4.37	23	2.33	3.80
Crohamhurst ...	5.30	22	3.78	6.32	Kairi ...			0.60	1.87
Esk ...	2.29	27	0.82	2.71	Sugar Experiment Station, Mackay	3.81	16	2.12	3.89
Gayndah ...	1.74	27	1.60	0.67	Bungeworgorai ...	1.29	2	1.14	1.43
Gympie ...	2.83	27	2.52	1.96	Warren ...	0.63	2	1.26	Nil
Glasshouse M'tains	2.82	6	7.28	5.27	Hermitage ...	0.91	7	1.98	3.49
Kilkivan ...	2.25	27	1.07	0.40					
Maryborough ...	3.08	27	2.18	1.82					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for May this year and for the same period of 1914, having been compiled from telegraphic reports, are subject to revision.

The Orchard.

PINEAPPLE PROPAGATION.

By G. WILLIAMS, Cairns.

As at least two of the most esteemed local pines have originated in this State, reputedly from sports, there appears rather more than a possibility that further improvement may be effected by raising new varieties from seeds. The smooth-leaf type, three varieties of which are known in this part of the State, admits of improvement in several directions, and this can most likely be accomplished in the manner indicated, particularly where care is exercised in fertilising—a rather slow but not laborious process. Fertilising may be confined to the lower half of the fruit, as it is seldom that seeds are produced beyond the centre. The Northern climate is particularly adapted for the furtherance of this object, but the horticultural possibilities are almost totally unrecognised. The principal drawbacks to this system of propagation, as applied to pines, is their general freedom from fertile seeds, consequently seedling plants are very rarely seen. The same principles, however, apply to pines as to other forms of vegetation, a stoppage or reduction of supplies inducing efforts towards reproduction. Though the practice does not seem readily applicable, still it is borne out in practice, thirty plants being raised from seed contained in six fruits, three rough and three smooth leaf, about 40 per cent. of seed proving infertile. The system entails very little trouble, merely removing that part of the plant, as with suckers for planting in earlier stages, immediately the first sign of fruit production is noted, and replanting in the ordinary manner. The deprivation of young plants of original source of supply from the parent roots has the desired effect, and fertilising of flowers may follow, if so desired as development progresses. The seeds, in appearance somewhat resembling those of an apple, will be found just beneath the skin of the fruit. They should be planted without unnecessary delay—preferably in seed-boxes. Germination is rather irregular, and growth for the first season slow. If young plants are by any means crowded, they should be picked out and replanted in light soil, contained in shallow boxes, at intervals of four to six inches. This will allow for sufficient development until far enough advanced to plant in the open, which, for several reasons, is inadvisable in the early stages. In about twelve months from planting the seed, the young pines will be sufficiently developed, and with good root growth, to plant in permanent positions where the quality can be determined. Three years may reasonably be accepted as a fruiting age. It was originally contended that the fruit of the Northern climate was invariably inferior. This contention, however, has no foundation in fact, as the plants exhibit greater vigour and

productiveness than in colder localities. Inferior types subject to general neglect had evidently created an erroneous impression. The fruit attains a large size under fair cultivation, is of fine quality, and fully flavoured. Smooth-leaf pines have, in one instance, attained a weight of 16 lb.; and pines of 10 to 14 lb. weight are not by any means exceptional. But the very large fruit are of too soft a nature to stand without damage their own weight, and are consequently not adapted for transport. In this direction there is opportunity for speculation and improvement by crossing with the firmer fleshed rough-leaf.

ERADICATING BANANA STOOLS.

“Old banana stalks,” says Mr. Brünnich, Agricultural Chemist, “and stools contain very large amounts of fertilising materials, which should be returned to the soil. It would be the greatest mistake to poison such stools, as the quantity of poison required would injure the soil. The stools must be dug out, and allowed to rot on the ground, to return humus and mineral matters to the soil, and a sandy soil requires this more particularly.”

The most wasteful methods of utilising lands for banana culture in North Queensland are adopted by the Chinese, and also by some European planters in the North and South. The general practice is to grow bananas on the same land continuously without the addition of manure to supply the loss of nitrogen and potash removed by the plants, and which are so vitally important to the production of heavy crops. The idea seems to be that the plantations are sufficiently renovated by cutting up the stems which have already borne fruit and leaving them to rot round the clumps of plants; but this is not only wholly insufficient, but has the great disadvantage of affording a safe breeding-place for many noxious insects and other pests. What should be done on a well-ordered plantation is, either to replant entirely after the sixth year, thus enabling the land to receive a thorough ploughing and manuring, or to rotate with some other crop. What the rotation crop should be depends on the locality, since what may be a profitable crop in one district may be utterly unsuitable to another.

GRAFTING PAPAW TREES.

Mr. C. Ross, Instructor in Fruit Culture, says that young seedling papaw-trees may be grafted when the stems are about 1 in. in diameter. He suggests the cleft graft as the most serviceable, but the graft must be carefully bound and waxed to prevent moisture penetrating the cleft. The scions should not be thicker than the stock, and these may be got from the side shoots along the old stems of female trees of a good bearing type.

WHITE ANTS ATTACKING FRUIT-TREES.

White ants in fruit-trees in time of drought will make their way from the dead wood into the living, with results fatal to the trees or vines. One remedy for the pest is to discover their under or over ground nest, and pour in bisulphide of carbon, either allowing the fumes to destroy the insects or exploding the chemical. A small quantity of arsenious acid placed in the soil around the tree, without touching the trunk, is also efficacious. Or pieces of pine wood saturated with some white ant mixture, such as Street's, and buried close to the trees will effectually destroy them. Apterite chipped into the soil will destroy white ants and not hurt the trees. A short paragraph in "Garden and Field" for June, 1915, says that "entomologists recommend that the soil be well opened out round the trunk and main roots, and any damaged wood or dead roots carefully cut away, and any scars painted with tar or paint. German potash (kainit), if mixed with the soil round the roots and trunk, 3 or 4 lb. to a large tree, will drive the white ants away, and also act as a manure for the tree treated. All dead wood, stumps, and stakes should be cleared out of infested ground, and any nests that can be found should be burnt out.

BLACK HEART IN PINEAPPLES.

The Ripley Queen pineapple is more subject to black heart than other varieties, and the winter crop is more or less affected by it, the summer crop being usually free. Both rough and smooth varieties do well in the Redland Bay district, but black heart is known there as well as in other parts of the State. The Brisbane district is the best for rough varieties. Wet and cold weather is the principal cause of the disease. However, taking the industry as a whole, the percentage of loss from this cause is not very serious in the year's output, and should not discourage anyone from entering upon the pineapple-growing industry.

GROWING ORANGES AND MANDARINS.

Mr. C. Ross, Instructor in Fruit Culture, says that the main principles to be observed in growing the above fruits are, that varieties such as the Navel orange and Scarlet mandarin, which have a drooping or pendulous habit of growth, should have a stem at least 3 ft. high before the first branches to form the head are allowed to form, whereas, with such varieties as Joppa orange, or Emperor mandarin, which are upright growers, the head should be established near the ground, above the graft. Dense growers require to be well thinned out, and strong, open growers should have extra vigorous shoots shortened back. It should be remembered that lemons produce their crop on lateral shoots as well as on terminals.

Horticulture.

THE CULTIVATION OF SUNFLOWERS.

By A. J. BOYD.

The Sunflower is one of the Compositæ and takes its origin from Central America. It is closely allied to the Jerusalem Artichoke. It will grow in almost any soil, and in any climate. It will withstand cold or heat, drought or rain. It is subject to no disease, and to no climatic disqualification.

SOIL AND CULTIVATION.

Although the plant is not very particular as to soil, it thrives best on deep, well-drained loam. It is advisable to sow early, say at the beginning of September, and ending in February. The quantity of seed required is from 4 to 6 lb. per acre. This should be sown in drills, 5 ft. between the rows, and 10 to 18 in. between plants in the row. The plant grows very rapidly, the crop being usually ready for harvest in three months.

Prepare the land as for corn (maize) and cover the seed no deeper than 2 in. During the growth, the cultivation consists in keeping the land clean and well pulverised, so as to break the capillary pores of the soil, and thus retain the moisture in it. This is a very important point, as the Sunflower is one of the greatest known evaporisers of moisture. When the plant is full grown it will evaporate from $1\frac{1}{2}$ to 2 lb. of water in 24 hours.

The Sunflower is, of course, grown for its seeds, which are very nutritious and contain a large quantity of oil. Thousands of acres in Russia are under this crop, and the yield of oil is estimated at from 40 to 50 per cent. of the total weight of the seeds. It is, in reality, much more, but, in the process of extraction, an important proportion of the oil remains, unfortunately, in the shelly seed envelopes. The seeds form a capital food for poultry, being nearly equal to buckwheat to induce hens to lay. The oil cake which remains after the extraction of the oil is, for feeding and manurial purposes, as valuable as linseed and cotton seed cake. The ash of the stalks, which often run up to 12 or 15 ft., is very rich in potash. Such ashes naturally form a capital manure and stimulant for plants requiring potash. The large leaves form an excellent green feed, greatly relished by all stock. In the large varieties, the flowers, or heads, as they are called, reach sometimes 18 in. in diameter. When the seeds are ripe, they are so thickly set that as many as 2,000 or 3,000 find place in a single head. These seeds are slightly wedge-shaped, and vary in colour, some being quite black, whilst others are grey or white streaked with black.

There are different varieties of the Sunflower, but the most profitable to grow is, undoubtedly, the Giant Russian, of which each head contains from 1,000 to 2,000 and even 3,000 seeds. It is closely followed by the black-seeded variety. It has been grown successfully under a great variety of circumstances and seasons in Queensland, and succeeded as well in the dry West as on the Downs and further North. It was found to do well on forest lands which are not too sticky.

A very necessary condition is, that the plants should be fully exposed to the sun, on which account European growers sow the seed in drills 5 ft. apart, and dibble the seed in at intervals of 3 ft., the plants being afterwards thinned out, because they have such an exuberant growth that they spread their branches and heads in successive layers over each other. This, however, does not apply to the Giant Russian variety, which, as already said, is the most profitable kind to grow commercially. Again, Sunflowers with many heads do not ripen the seed evenly; therefore it is best to cultivate a species which produces only one head to each plant. The Giant Russian is such a variety and may be planted closer than any other, and on suitable soil, and with good cultivation in its young stages, will yield up to 50 bushels per acre. When the plants are about 12 in. high, a slight hilling up benefits them very much.

HARVESTING.

Some growers advise harvesting when the seed heads are quite ripe, but in countries like Russia and America, where the plant is grown on a large scale, the harvesting takes place before the seed is quite ripe, in order to avoid loss by "shattering"—that is, by the shedding of many of the seeds.

A very expeditious way to harvest is to cut the stems close to the ground by means of a horse corn-stalk cutter, and to cart home stems and heads together to the barn or drying shed. There the heads should be dried as quickly as possible by good ventilation and protection from damp, so as to avoid the formation of mouldiness in their fleshy parts and on the seeds. As soon as they are dry enough, they may be threshed with a flail, no special machinery having been put on the market for this work. When threshed, the seeds are winnowed. A simple winnowing machine is easily manufactured on the farm.

A bushel of Sunflower seed varies, according to the kind grown, from 25 to 35 lb., the average being about 30 lb.

The seed yields from 15 to 20 per cent. of oil by cold pressure. The stems may be ensiled and rendered palatable food for stock. The yield of green matter at the Maine, U.S.A., Experiment Station has been from 11,000 to 12,000 lb. per acre, containing from 2,000 to 2,700 lb. of dry matter. The price of Sunflower seed in Australia is about £15 per ton, so that a 40-bushel crop would, at 30 lb. weight per bushel, be worth about £7 10s. There is a good market for the product in this and in the Southern States.

RAISING A YELLOW SWEET PEA.

In an article on this subject, the editor of "South African Gardening" mentions that a fortune awaits the man who can raise a pure yellow sweet pea, but it must be purest yellow, not even a light sulphur colour. Many hybridists are at present working to this end; but, so far, the pure yellow flower has evaded them. This should not discourage anyone from trying his hand at raising such a flower, for Nature may respond to your touch more readily than to the touch of another, and although the yellow sweet pea has not yet been raised, still the possibilities are there; in fact there are many who look upon the introduction of the yellow flower as being only a matter of time. There is not much chance of finding a yellow flower amongst your rows of fixed plants; it has got to be worked for methodically and determinedly, and the only way of raising a flower of this kind is by cross-fertilising two flowers which are likely to produce a yellow when combined. Let us first of all describe the process of cross-fertilisation.

THE TIME TO FERTILISE.

The flower shown at B Fig. 1 is in the right state of development to be crossed, and the one next to it on the stem shows the time at which the anthers should be removed.



FIG. 1.

CROSS-FERTILISATION EXPLAINED.

Before seed can be produced it is necessary that the flower should be fertilised. Fertilisation is effected by the pollen of the same flower or a flower of the same family coming in contact with the pistil. Some

flowers are self-fertilising, whilst others lend themselves to cross-fertilisation. The sweet pea, however, is a self-fertilising flower—that is to say, the pistil and stamens are both found in the same flower. Therefore, if we want to make a cross it is necessary to prevent self-fertilisation. This is done by taking the flower when it is still quite young and removing the anthers, just as the flower begins to show colour and the standard turns upright. This is easily done by taking the petal which surrounds the keel of the flower—*i.e.*, the bottom petal—between the thumb and the fingers, levering it at first slightly towards you, and finally in a downward direction; you will then find the anthers and the pistil exposed, and if you have taken the flower at a young enough stage the anthers will be solid little yellow lobes supported upon fine stems, both ten in number. The pistil will be seen as a stouter growth turning upwards at the end (see Fig. 2), and if it is examined closely it will be noticed to be covered with a quantity of fine hairs, for the purpose of catching the pollen grains, which in the ordinary course would burst from the anthers. But to cross-fertilise the pea you must remove all these anthers and push the petal, that you have pulled down, back into its proper position; let this stand for two days, and now take a more advanced flower of another variety, again pull down the petal as before, and, holding it upside down, work the pollen of the second flower on to the pistil of the first flower from which you have removed the anthers. This pollen should be a bright yellow colour to be in a proper condition for fertilisation, and when the pistil is more or less covered, the petal that has been pulled down is again allowed to take its natural position, and the flower is labelled and watched.

Some believe in tying the flower in a muslin sack to prevent bees and insects interfering with the cross, by carrying pollen from other flowers on to the one hybridised. But speaking from experience I may safely say that I think this absolutely unnecessary and in fact detrimental to the production of a really good hard seed.

NOTING THE CROSS AND ITS RESULTS.

This is very important, and must be carefully done; the best means is to keep a note of all the crosses made and to label each flower in this way—

A1 \times F4. The letter will represent a colour; suppose we make A represent blue and F pink, the numbers will represent the names of varieties used. In this case we might say that Flora Norton Spencer has been worked on to Countess Spencer; these are shown in the notebook in this way: A1 \times F1, Flora Norton Spencer \times Countess Spencer, and under the heading A \times F you should keep all the blue hybridised on to pinks. This gives us a complete and easily followed record of our experiments, and when we have learnt the letters we have assigned to different colours we can tell at a glance what kind of a cross was made, only referring to the book to find out the particular varieties used. When the seed is collected always keep it carefully labelled and sown separately next year.

PISTIL AND ANTHERS.

Fig. 2 shows a flower with all the petals removed; also a section of the flower with anthers, and a section with the anthers removed.

CROSSING TWO SWEET PEAS.

Fig. 3 shows a flower with the anthers removed and pistil developed; shows same flower with the anthers of another flower being brushed against the pistil, which will collect the pollen, and so become fertilised and bear seed.



FIG. 2.



FIG. 3.

THE FIRST YEAR AFTER CROSSING.

The results during the first year after crossing will no doubt be very disappointing to those who have never tackled this kind of work before, for the flowers usually consist of ugly blue, maroon, and mauve shades, but seed from these must be saved for another season, and the next time it flowers many colours and forms will be found to result from the same cross. Seed should be saved again from the various plants separately—*i.e.*, the various breaks must be kept to themselves, but flowers showing the same form may be collected together.

Now comes the roguing process, for the seeds that are sown will throw back when grown next year, but if these rogues are carefully taken out, the next year's sowing should give you a practically pure stock and the result of your cross. There may be a few rogues in it, but not many. These, of course, must be carefully removed until the stock is quite true.

VARIETIES TO CROSS.

Opinions differ as to the most likely colours to give yellow, but my experience points to varieties with the colour of Helen Lewis crossed

with dark colours, such as King Manoel, or even scarlet varieties, such as Scarlet Emperor. Another likely cross would be, say, Edith Taylor or a similar variety crossed with a blue. I know these colours are not the one that many experts would recommend as being the most likely to give yellow flowers, but about five years ago out of a great number of crosses I made these gave the nearest approach to yellow. The work of hybridising and roguing looks a big task when it is put into writing, but it is really very simple and intensely interesting. Added to this there is an excellent chance of making quite a considerable sum of money at any moment.

[We asked two sweet-pea growers if they had ever seen a pure yellow sweet pea in Queensland or elsewhere. Both said they had. We have never seen one ourselves. In 1885 Mr. Eckford evolved the Orange Prince variety. The Robert Sydenham is a magnificent orange self, and is described as of the best waved Spencer form. The pure orange yellow has not yet been obtained, although, as far as yellow is concerned, sweet peas of a pale buff or sulphur colour have been raised.—Ed. "Q.A.J."]

SWEET PEA NOTES.

Don't overfeed the plants before the blooms appear.

Manuring with rich nitrogenous manures—sulphate of ammonia, nitrate of soda, and fowl manures—makes a very rank growth which is susceptible to the dreaded "streak" disease. This disease usually appears just at blooming time.

Make the plants hardy. The winter ones will grow slowly until the warm spring months. Do not feed these until then. Use the hoe to keep weeds down.

We have never been troubled with streak. We ascribe our "luck" to the fact that we use very few nitrogenous manures. A little super and well-rotted stable manure well worked into the soil are quite sufficient in most cases to secure good flowers

STRAWBERRY CULTURE.

The strawberry will do well in the vegetable garden if planted out early enough. The soil must be well prepared. Trenching is almost necessary in most soils. Use well-rotted stable manure. Take out drills 2 ft. apart and 1 ft. deep; place well-rotted stable manure and some super at the bottom. Cover over again with soil. Plant strawberry runners on the top of the drills, spacing them 18 in. apart. Set the runners in firmly, spreading out the roots with the crowns just on the surface. May and June are the best months for setting out. If planted early you may expect a crop the same season. No weeds must be allowed to grow near the plants.

As soon as the spring approaches, loosen the soil and spread straw rather thickly around the plants. This will keep the fruit clean and will also act as a mulch for the bed. Don't use a litter that will fill the ground with weeds (the greatest enemy to successful strawberry culture).

Soon after the fruiting season is over runners will appear. All except those required for fresh planting must be cut away.

When rooted the runners may be severed from the parent plant.

Some growers space the strawberry plants in rows 4 ft. apart, and allow all the runners to grow between the parent plants, forming a matted bed 4 ft. wide.

The strawberry responds to irrigation, and most profitable crops are grown under such favourable condition. A north-easterly slope is the best aspect to secure early crops.

No plant is more profitable to grow and none more readily responds to good cultivation than the strawberry.

A small area well tilled and cared for will yield better fruits than large ones allowed to run wild.

The best varieties are Melba, Sunbeam, Royal Sovereign, Edith, and Federation.

[The above useful hints on strawberry-growing from "Garden and Field," as well as those on sweet pea culture from the same source, come just at the time when information on these subjects is constantly being asked for. The manuring of sweet peas is not generally understood by amateur gardeners, who in most cases cause injury, and even disease, to young plants by a too free use of nitrogenous manures with a view to forcing them into rapid growth. In this State, sweet peas have been largely sown in numbers of city and suburban gardens, especially in the South, and the hints given as above, if followed, will have a beneficial effect.—Ed. "Q.A.J."]

CURE FOR WORMS IN HORSES.

Mr. J. F. Keane, Carbeen, writes: "It is more than twenty years since anyone saw a horse of mine that had been a week in my possession troubled with worms. Wherever I am, I always have a few sunflowers growing, even if I have to water them. A handful of the leaves given to a horse once a month keeps him quite free from intestinal worms. I think it is the spicules on the leaf that act as a simple mechanical vermicide." This is a very simple remedy, and one worth experimenting with.

Botany.

CONTRIBUTIONS TO THE FLORA OF QUEENSLAND.

By F. MANSON BAILEY, C.M.G., F.L.S., Colonial Botanist.

Order JUNCACEÆ.

XANTHORHÆA, Sm.

X. media, *R. Br. Prodr.* 288. This species approaches very closely to *X. hastilis*, *R. Br.*, but it seems necessary to retain it as a distinct species on some small differences. Stem rather short, leaves long, ancipitous. Inflorescence as in *X. hastilis*, but the bracts and perianth segments not bearded.

Hab.: Forest country, North Pine, *E. W. Bick*, April, 1915. Produces a fair amount of resin.

X. quadrangulata, *F. v. M.* This has been collected in different localities by Mr. E. W. Bick (Gympie road, near Brisbane, Sunnybank, Mount Debatable, and Springsure), and said to be abundant in all, so that it would appear to be one of our commonest species. It is a good yielder of resin.

ADIANTUM, Lim.

A. Whitei, *Bail.*, n. sp. (Plate 5.) Rhizome creeping. Stripes and rhachis hispid. Fronds $\frac{3}{4}$ to $1\frac{1}{2}$ ft. high, mostly bipinnate but slightly tripinnate at the base. Primary pinnae numerous, always simply pinnate at the end. Pinnules numerous, usually small, $\frac{1}{4}$ to $\frac{1}{2}$ in. long, the under surface with a few scattered hairs or bristles. Sori not very abundant. Indusia orbicular or somewhat reniform.

Hab.: Kenmore, *J. E. Young* and *C. T. White*, July, 1914; *C. T. White*, May, 1915.

In its hispid nature this new species approaches *A. hispidulum*, *Swartz*. It is well worthy of garden culture.

Order HEPATICÆ.

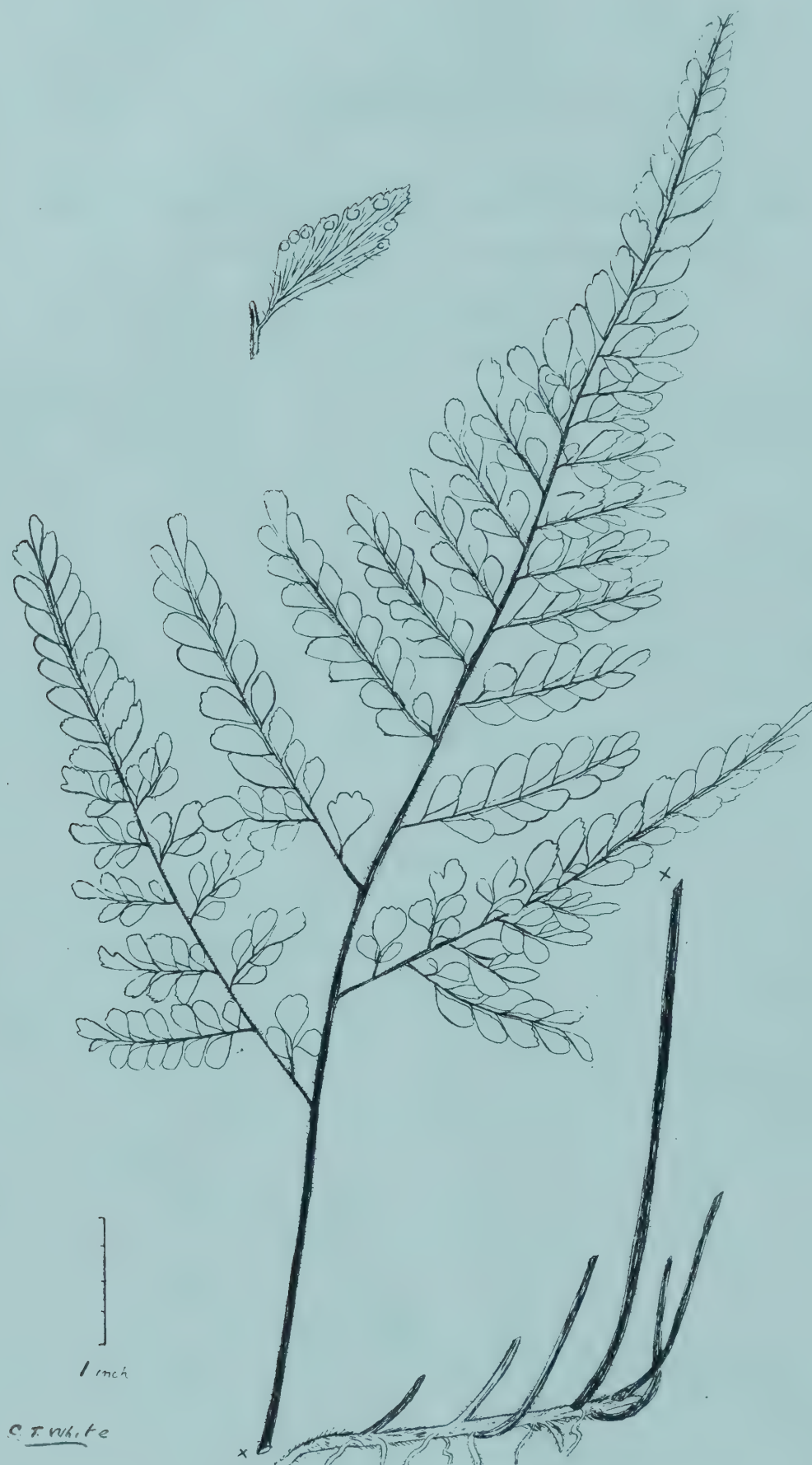
Lepidozia lateconica, *Stephani*.

Hab.: Barron Falls, *Mrs. Brotherton*.

Order FUNGI.

Polyporus australiensis, *Wakefield*.

Hab.: Coomera River, on logs. *Tryon* and *White*.

PLATE 5.—*ADIANTUM WHITEI*, Bail.

Plant Pathology.

PANAMA DISEASE OF BANANAS.

The "Journal of the Jamaica Agricultural Society" (December, 1914), referring to the measures taken in the United States of America to stamp out foot-and-mouth disease in cattle and swine, says:—

"A general spread of Panama disease among our bananas here would be of more consequence to us than the wiping out of cattle, &c., in the United States by foot-and-mouth disease, so we ask the support and help of all our readers in preventing the spread of Panama disease where it has occurred and wherever it may occur. We ask our readers for their co-operation, and we particularly ask the co-operation of our branch societies and all their members individually—to learn all they can from the instructors about the symptoms of Panama disease, and to keep a sharp lookout for any possible cases. So many men have been coming from Costa Rica that it would be wonderful if we escaped infection. The germs can be carried on the soles of a man's working boots or on his cutlass if he brings one back with him unknown to the Customs authorities. Infection can be carried from field to field by men walking past an infected root. It can be carried by men taking cocoës or any such roots from an infected field to another field; a cutlass used on an infected plant would certainly carry it to another plant if used again without disinfection.

"Here is what was done by a farmer in an infected district in the United States to save his herd when foot-and-mouth disease broke out. At the first outbreak of this disease he rigidly quarantined his entire premises, allowing no one to enter or leave. The cattle were kept continually in the barns, and the men who cared for them were compelled to wade through a strong disinfecting solution each time both before entering and leaving the stable. In addition, the stalls, floors, utensils, and manure were repeatedly sprayed with the disinfecting solution.

"Where this disease (foot-and-mouth) breaks out among cattle, the entire herd is slaughtered—*i.e.*, every animal on the premises is killed and buried in quicklime, the local State paying half of the cost and the Government half.

"We should do something like this with Panama disease. We can afford to run no risks. Every place this disease breaks out should be thoroughly quarantined, and no one should be allowed to go into or out of the field except by necessity, and then they should wash their hands and feet, or dip their boots in a strong disinfecting fluid; the cutlass used should be passed through fire; all the bananas in the case of a small place should be utterly destroyed and burned; and on a large place a wide area around any infected place should be kept under

quarantine, and fenced with close-mesh wire so that no fowl or pig can go in or out. Pigs would probably carry the disease worst of all. It must be noted that Panama disease is a soil disease, and the germs are in the soil and pass through the soil. It is not the stems of the bananas alone that must be destroyed, but all the roots which may spread 16 ft. around.

“We hope our readers will recognise the seriousness of this matter and not treat it lightly.”

With reference to the so-called “Panama disease of bananas,” H. Tryon, Government Entomologist and Vegetable Pathologist to the Department of Agriculture and Stock, Queensland, wrote, in general terms, in 1914 on “Root Disease of the Banana in Queensland,” as a contribution to an article by us on “The Banana in Queensland” (Bulletin, Queensland Department of Agriculture, 1914). In this he stated as follows:—“The root disease, as hereinafter described, is evidently identical with or is closely related to the malady that attacks with special virulence the Gros Michel variety in Central America, and in some of the West Indian Islands (Cuba, Jamaica, Surinam), and is known generally as ‘the Panama disease.’” He does not, as we now learn, favour the view advanced by S. F. Ashby (1913) that this disease is caused by a parasitic fungus belonging to the genus *Fusarium* growing in the tissue, but finds some evidence that the malady is primarily due to bacteria, and that the mycelium of *Fusarium* pervades the spiral vessels, the scene of the activity of these, and for whose growth therein they have “paved the way.”

BAIT FOR CUTWORM.

The Superintendent of Entomology, Honolulu, Hawaii, in his report for 1914, dealing with plant pests, advises that, for the destruction of the cutworm, the following may be used with good results:—

Mix Paris green or white arsenic dry with bran; add molasses and just enough water to moisten the mass. The proportions of the ingredients are—Paris green or white arsenic, 1 lb.; molasses, $\frac{1}{2}$ gallon; bran, 20 lb. Place the mixture in rows in the infected field. Frequent rain will make it necessary to repeat the operation. The mixture should be placed between rather than on the plants. Care must be taken to keep domestic animals out of fields treated in this manner.

In the case of houses, bush-houses, &c., infested by

BLACK ANTS,

he says that these may be so reduced in numbers as to give very little trouble for some time by trapping them with sponges moistened with either sweetened water or diluted bouillon, and placed where the ants swarm. After the sponges are covered with ants, they can be dropped into boiling water, cleaned, and the process repeated.

General Notes.

ROSELLA, JAM, JELLY, AND WINE.

To every pound of shell, allow about 1 lb. of sugar. A little water. When making rosella jam it is necessary to separate the shell from the pod. Tie the pods up in a piece of mosquito net, and put them into the preserving pan with the rosellas, sugar, and water. Allow this to stand by the fire for an hour, where it is just hot enough to bring them slowly to a boil. Simmer gently for an hour and a-half or two hours. Then take out the pods, let the jam cool, and then put into preserve jars.

ROSELLA JELLY.

To every pint of juice add 1 lb. of sugar and a little water. When making the jelly there is no occasion to pick them; you can put them in the preserving pan just as you get them, with a little water to every pint of fruit. Allow it to boil for two or three hours, then strain it through a sieve. Put 1 lb. of sugar to every pint of juice, and put this back in the preserving pan, and boil for an hour or until it jellies in a saucer. When cool, fill the preserve jars, and when cold fasten them up securely.

ANOTHER RECIPE FOR JELLY.

One cupful of the pod to 3 pints of the shell. Enough water to float the rosellas. Boil until soft; strain off the juice, and replace in the pan with 1 lb. of brewers' crystals to each pint of juice. Boil for about three-quarters of an hour, skimming well; and make sure, by dropping a little on a plate (before removing it from the fire), that it will be jelly when cold.

ROSELLA WINE.

Put the fruit into a cask that has one head out. Pour boiling water over the fruit; rather more than enough to cover it. Let this stand for about three days; stir now and again. At the end of three days strain the liquor into another cask—this cask to have both heads in. Then, for every gallon liquor take 3 lb. of sugar, and make a good thick syrup of the same. Pour this syrup while hot into the liquor, and stir well. Leave the cask with the bung out until fermentation starts. Should this not occur in, say, twenty-four hours, add a bottle of yeast. Keep this cask in as even a temperature as possible, as this will help the fermentation. In the process of fermentation you will lose some of your liquor. Should it ferment thoroughly, save the liquor that overflows from the bunghole, and put it back in the cask; but should this not suffice to keep the cask full, add a little warm water. When the liquor has almost finished fermenting—say when it stands at 3 degrees density by the Beaumé saccharometer—bung up the cask and leave for three months. Then bottle.

SCARCITY OF POTASH.

Potash being no longer obtainable by fruit-growers and others on the land, Mr. J. C. Brännich, Agricultural Chemist, advises in the meantime to apply wood ashes and compost, and also limestone screenings, at the rate of about 2 tons per acre, which will liberate some potash from the soil.

A WEATHER GLASS

Which any farm boy can make with a few simple materials, is explained in the "Farmers' Gazette."

Make up the following mixture:—Camphor, $2\frac{1}{2}$ drachms; alcohol, 11 drachms; water, 9 drachms; and 38 grains each of saltpetre and sal-ammoniac. Pour this mixture into a tall, narrow bottle of clear glass, and not less than 7 in. in height. Close the bottle either with a cork or with a piece of parchment tied round its neck. A pin-hole must be made so as not to exclude atmosphere. From day to day the appearance of the solution varies considerably according to the state of the atmosphere. When the conditions are likely to be fine and dry, the solid elements collect together at the bottom of the bottle, and all the upper part is clear. At the approach of rain, the solid particles take on a beautiful feathery formation, which spreads upwards through the clear liquid, making a pretty effect. As the conditions become increasingly stormy, the feathery growth extends till the whole of the interior of the bottle is filled with beautiful sprays. In the case of a very high wind or a sudden electrical outburst, the sprays tend to concentrate at the top of the bottle just below the cork. The storm glass, as a rule, gives good warning of a coming change, usually twenty-four hours in advance, and a study of the variations of the growth will soon acquaint the owner with the meaning of the different phases, so that a good idea of the coming weather may be ascertained. For the most perfect working, it will be found that the storm glass should not be placed on a mantel-shelf, or anywhere near a fire; and, on the whole, the best possible position will be in a window. Here the device can be readily observed, and at the same time it is fairly well in touch with the conditions out of doors.

PASSION-FRUIT PULP.

It should be quite a simple matter, says the "Farm Gazette," to install a small home-canning outfit and pulp passion-fruit. The following recipe has been tried and found successful by the New South Wales Department of Agriculture at its Wagga orchard:—The fruit should be ripe and sweet. Remove the pulp and place in tins, solder down the lids, then exhaust for five minutes in boiling water, solder up hole in lid, and reboil for twenty minutes; then remove and allow to cool. It requires 2 lb. of passion-fruit to make 1 lb. pulp.

TIME DURING WHICH CROPS OCCUPY THE GROUND.

Maize: 4 to 6 months, according to the variety sown.

Potatoes: 8 to 16 weeks, the former period only apply to varieties which mature very quickly.

Barley: 5 to 6 months.

Oats: 5 to 6 months.

Wheat: 5 to 6 months.

All the above periods may be taken as approximate only, and are more or less affected by the variety of the respective crops planted, their environment, and the season experienced.

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR
JUNE, 1915.

Article.								JUNE.	
								Prices.	
Bacon	...	...	...	...	...	...	lb.	8d. to 10½d.	
Bran	...	...	...	...	...	...	ton	£12 10s.	
Butter	...	...	...	...	...	...	cwt.	205s.	
Chaff, Mixed	...	...	...	...	...	...	ton	£7 5s. to £8 10s.	
Chaff, Oaten	...	...	...	...	...	...	"	£9 5s. to £10	
Chaff, Lucerne	...	...	...	...	...	...	"	£9 15s. to £13	
Chaff, Wheaten	...	...	...	...	...	...	"	£5 5s.	
Cheese	...	...	...	...	...	...	lb.	1s.	
Flour	...	...	...	...	...	...	ton	£19 10s.	
Hams	...	...	...	...	...	...	lb.	1s. to 1s. 1d.	
Hay, Oaten	...	...	...	...	...	...	ton	£16	
Hay, Lucerne (Prime)	...	...	...	...	...	...	"	£7 to £11	
Honey	...	...	...	...	...	...	lb.	3d. to 3½d.	
Maize	...	...	...	...	...	...	bush.	5s. 3d. to 5s. 10d.	
Oats	...	...	...	...	...	...	"	6s. 6d. to 7s. 6d.	
Onions (Victorian)	...	...	...	...	...	...	ton	£9	
Peanuts	...	...	...	...	...	...	lb.	3d. to 3½d.	
Pollard	...	...	...	...	...	...	ton	£13 10s.	
Potatoes	...	...	...	...	...	...	"	£9 to £10	
Potatoes (Sweet)	...	...	...	...	...	...	cwt.	3s. 6d. to 4s. 4d.	
Pumpkins	...	...	...	...	...	...	ton	£5 to £5 10s.	
Eggs	...	...	...	...	...	...	doz.	1s. 9d. to 2s. 8d.	
Fowls	...	...	...	...	...	...	pair	2s. 9d. to 3s. 6d.	
Ducks, English	...	...	...	...	...	...	"	2s. to 3s. 3d.	
Ducks, Muscovy	...	...	...	...	...	...	"	3s. 6d. to 5s.	
Turkeys (Hens)	...	...	...	...	...	...	"	6s. to 8s. 6d.	
Turkeys (Gobblers)	...	...	...	...	...	...	"	9s. to 14s.	
Wheat	...	...	...	...	...	...	bush.	8s.	

VEGETABLES.

Cabbages	...	...	...	...	...	...	per dozen	4s. to 11s. 6d.	
Peas	...	...	...	...	...	...	per sugar bag	6s. to 12s.	
Beans	...	...	...	...	...	...	" "	9s. to 14s.	
Carrots	...	...	...	...	...	...	per dozen bunches	1s. to 1s. 6d.	
Cucumbers	...	...	...	...	...	...	per dozen	...	
Custard Marrows	...	...	...	...	...	...	"	2s. 6d. to 5s. 9d.	
Vegetable Marrows	...	...	...	...	...	...	"	2s. 6d. to 5s. 9d.	
Beetroot	...	...	...	...	...	...	per dozen bunches	1s. to 1s. 6d.	
Chocos	...	...	...	...	...	...	per quarter-case	2s. to 2s. 9d.	
Sweet Potatoes	...	...	...	...	...	...	per cwt.	...	
Table Pumpkins	...	...	...	...	...	...	per ton	£4 10s.	
Tomatoes	...	...	...	...	...	...	per quarter-case	8s. 3d.	
Turnips	...	...	...	...	...	...	per dozen bunches	1s. to 1s. 4d.	
Rhubarb	...	...	...	...	...	...	per bundle	1s. to 1s. 6d.	
Lettuces	...	...	...	...	...	...	per dozen	...	

SOUTHERN FRUIT MARKETS.

Article.	JUNE.				
	Prices.				
Bananas (Queensland), per case	15s. to 18s.
Bananas (Fiji), per case	26s.
Bananas (G.M.), per case
Mandarins, per case	5s 6d. to 6s.
Oranges (Navel), per case	14s. to 15s.
Oranges (Other), per case	6s. 6d. to 12s.
Passion Fruit, per half-case	1s. 6d. to 7s.
Papaw Apples, per half-case
Pineapples (Queens), per case	8s. to 12s.
Pineapples (Ripleys), per case	5s. to 9s.
Pineapples (Common), per case	5s. to 9s.
Tomatoes, per quarter-case	5s. to 6s.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	JUNE.				
	Prices.				
Apples (Tasmanian), Eating, per case	7s. to 10s.
Apples (Local), per case	6s. to 8s.
Apples, Cooking, per case	6s. to 7s.
Apricots, per quarter-case
Bananas (Cavendish), per dozen	3d. to 5½d.
Bananas (Sugar), per dozen	2½d. to 4d.
Cape Gooseberries, per quarter-case
Cherries, per quarter-case
Cocoanuts, per sack	12s. to 15s.
Custard Apples, per quarter-case	3s. 6d. to 5s.
Granadillas, per quarter-case	2s. to 3s.
Lemons (Local), per case	3s. to 5s.
Lemons (Italian), per case	9s.
Mandarins, per half-case	4s. to 9s.
Mangoes, per quarter-case
Nectarines, per quarter-case
Oranges (Navel), per case	6s. 6d. to 7s. 6d.
Oranges (other), per case	3s. 6d. to 6s.
Papaw Apples, per quarter case	1s. 6d. to 2s. 8d.
Passion Fruit, per case	2s. to 4s.
Peaches, per quarter-case
Peanuts, per pound	3d. to 3½d.
Pears (Victorian), per case	8s. to 11s.
Rosellas, per sugar bag	1s. to 2s. 6d.
Persimmons, per quarter-case
Pineapples (Ripley), per case	1s. 6d. to 3s.
Pineapples (Rough), per dozen	9d. to 1s. 6d.
Pineapples (Smooth), per dozen	3s. to 5s.
Strawberries, per tray
Strawberries, per dozen boxes
Tomatoes, per quarter-case	6s. to 8s. 3d.

TOP PRICES, ENOGGERA YARDS, MAY, 1915.

Animal.	MAY.
	Prices.
Bullocks	£14 to £18
Cows	£10 7s. 6d. to £12 15s.
Merino Wethers	25s. 3d.
Crossbred Wethers	26s. 3d.
Merino Ewes	19s. 6d.
Crossbred Ewes	23s. 9d.
Lambs	23s.
Pigs (Porkers)	39s.

LONDON QUOTATIONS.

Article.	JUNE.
	Prices.
Danish Butter cwt.	144s. to 146s.
Cotton lb.	5 25d.
Hemp ton	£32 15s.
Rubber (Fine hard Parà) lb.	2s. 7 ³ / ₈ d.
Rubber, Plantation "	2s. 4 ³ / ₈ d.
Copra, South Sea ton	£22



TIMES OF SUNRISE AND SUNSET AT BRISBANE—1915.

COMPUTED BY D. EGLINTON, F.R.A.S.

Date.	MAY.		JUNE.		JULY.		AUGUST.		PHASES OF THE MOON, 1915. On or about the 150th Meridian, East Long.
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	6.14	5.17	6.31	5.0	6.39	5.3	6.30	5.18	<p>The moon will be at its brightest not only when full, but because it will this month be at its least distance from the earth at that time.</p> <p>6 May ☾ Last Quarter 3 22 p.m. 14 " ● New Moon 1 31 " 22 " ☾ First Quarter 2 50 " 29 " ○ Full Moon 7 33 a.m.</p>
2	6.14	5.16	6.31	5.0	6.39	5.3	6.30	5.18	
3	6.15	5.15	6.32	5.0	6.39	5.3	6.29	5.19	
4	6.15	5.14	6.32	5.0	6.40	5.4	6.28	5.20	
5	6.16	5.13	6.33	4.59	6.40	5.4	6.27	5.21	
6	6.17	5.12	6.33	4.59	6.40	5.4	6.27	5.21	<p>The moon will be at its greatest distance from the earth on 11th June at 10 a.m., and nearest on the 26th at midday.</p> <p>5 June ☾ Last Quarter 2 32 a.m. 13 " ● New Moon 4 57 " 21 " ☾ First Quarter 12 24 " 27 " ○ Full Moon 2 27 p.m.</p>
7	6.17	5.12	6.34	4.59	6.40	5.5	6.26	5.21	
8	6.18	5.11	6.34	4.59	6.40	5.5	6.25	5.22	
9	6.18	5.11	6.34	4.59	6.40	5.5	6.24	5.22	
10	6.19	5.10	6.35	4.59	6.40	5.6	6.24	5.22	
11	6.19	5.10	6.35	4.59	6.39	5.6	6.23	5.23	<p>The moon will be at its greatest distance from the earth on 8th July, about 9 p.m., and at its nearest on the 24th at 3.24 p.m.</p> <p>4 July ☾ Last Quarter 3 54 p.m. 12 " ● New Moon 7 30 " 20 " ☾ First Quarter 7 9 a.m. 26 " ○ Full Moon 10 11 p.m.</p>
12	6.20	5.9	6.35	4.59	6.39	5.6	6.23	5.23	
13	6.20	5.9	6.35	4.59	6.39	5.7	6.22	5.24	
14	6.20	5.8	6.36	4.59	6.39	5.7	6.21	5.25	
15	6.21	5.8	6.36	5.0	6.38	5.8	6.20	5.26	
16	6.21	5.7	6.36	5.0	6.38	5.8	6.19	5.26	<p>The moon will be at its greatest distance from the earth on 5th August at 36 minutes after 12, midday, and at its nearest on the 20th about midnight.</p> <p>3 Aug. ☾ Last Quarter 7 27 a.m. 11 " ● New Moon 8 52 " 18 " ☾ First Quarter 12 17 p.m. 25 " ○ Full Moon 7 40 a.m.</p>
17	6.22	5.6	6.37	5.0	6.38	5.9	6.18	5.26	
18	6.22	5.5	6.37	5.0	6.37	5.10	6.17	5.27	
19	6.23	5.5	6.37	5.0	6.37	5.11	6.16	5.27	
20	6.23	5.4	6.38	5.0	6.36	5.12	6.15	5.27	
21	6.24	5.4	6.38	5.0	6.36	5.12	6.14	5.28	
22	6.24	5.4	6.38	5.0	6.36	5.12	6.13	5.28	
23	6.25	5.3	6.38	5.0	6.35	5.13	6.12	5.29	
24	6.25	5.3	6.38	5.1	6.35	5.13	6.11	5.29	
25	6.26	5.3	6.39	5.1	6.35	5.13	6.10	5.30	
26	6.26	5.2	6.39	5.1	6.34	5.14	6.9	5.30	
27	6.27	5.2	6.39	5.2	6.34	5.14	6.8	5.31	
28	6.28	5.2	6.39	5.2	6.33	5.15	6.7	5.31	
29	6.29	5.1	6.39	5.2	6.32	5.16	6.6	5.32	
30	6.30	5.1	6.39	5.3	6.31	5.17	6.5	5.32	
31	6.30	5.1	6.31	5.17	6.5	5.33	

For places west of Brisbane, but nearly on the same parallel of latitude— $27\frac{1}{2}$ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun will rise and set about 4 minutes later than at Brisbane, and at Oontoo (longitude 141 degrees E.) about 48 minutes later.

At St. George, Cunnamulla, and Thargomindah the times of sunrise and sunset will be about 18 m., 30 m., and 38 minutes, respectively, later than at Brisbane.

At Roma the times of sunrise and sunset during May, June, July, and to the middle of August may be roughly arrived at by adding 20 minutes to those given for Brisbane.

The moonlight nights each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case it will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably with regard to the ecliptic.

[All the particulars given on this page were computed by D. Eglinton, F.R.A.S., and should not be reproduced in local newspapers without acknowledgment.]

Farm and Garden Notes for August.

This and the following two months are about the busiest periods of the year so far as work in the field is concerned; and the more activity now displayed in getting in the summer crops, the richer will be the reward at harvest time. Potatoes should be planted, taking care to select only good sound seed that has sprouted. This will ensure an even crop. Yams, arrowroot, ginger, sisal hemp, cotton, and sugar-cane may now be planted. Sow maize for an early crop. If the seed of prolific varieties is regularly saved, in the end it will not be surprising to find from four to six cobs on each stalk. This has been the experience in America, where the selecting of seeds has been reduced to fine art.

In choosing maize for seed, select the large, well-filled, flat grains. It has been shown that, by constantly selecting seed from prolific plants, as many as five and six cobs of maize can be produced on each stalk all over a field. A change of seed from another district is also beneficial. Sow pumpkins, either amongst the maize or separately, if you have the ground to spare. Swede turnips, clover, and lucerne may be sown, but they will have to contend with weeds, which will begin to vigorously assert themselves as the weather gets warmer; therefore, keep the hoe and cultivator constantly going in fine weather. Tobacco may be sown during this month. If vines are available, sweet potatoes may be planted towards the end of the month. In this case also it is advisable to avoid too frequent planting of cuttings from the old vines; and to obtain cuttings from other districts. If grasses have not yet been sown, there is still time to do so, if the work be taken in hand at once. Sugar-cane crushing will now be in full swing, and all frosted cane in the Southern district should be put through the rollers first. Plough out old canes, and get the land in order for replanting. Worn-out sugar lands in the Central and Northern districts, if not intended to be manured and replanted, will bear excellent crops of sisal hemp. Rice and coffee should already have been harvested in the North. The picking of Liberian coffee, however, only begins this month. Collect divi-divi pods. Orange-trees will be in blossom, and coffee-trees in bloom for the second time. As this is generally a dry month in the North, little can be done in the way of planting.

Kitchen Garden.—Nearly all spring and summer crops can now be planted. Here is a list of seeds and roots to be sown, which will keep the market gardeners busy for some time: Carrots, parsnip, turnip, beet, lettuce, endive, salsify, radish, rhubarb, asparagus, Jerusalem artichoke, French beans, runner beans of all kinds, peas, parsley, tomato, egg-plant, sea-kale, cucumber, melon, pumpkin, globe artichokes. Set out any cabbage plants and kohlrabi that are ready. Towards the end of the month plant out tomatoes, melons, cucumbers, &c., which have been raised under cover. Support peas by sticks or wire-netting. Pinch

off the tops of broad beans as they come into flower to make the beans set. Plough or dig up old cauliflower and cabbage beds, and let them lie in the rough for a month before replanting, so that the soil may get the benefit of the sun and air. Top dressing, where vegetables have been planted out, with fine stable manure has a most beneficial effect on their growth, as it furnishes a mulch as well as supplies of plant food.

Flower Garden.—All the roses should have been pruned some time ago, but do not forget to look them over occasionally, and encourage them in the way they should go by rubbing off any shoots which tend to grow towards the centre. Where there is a fine young shoot growing in the right direction, cut off the old parent branch which it will replace. If this work is done gradually it will save a great deal of hacking and sawing when next pruning season arrives. Trim and repair the lawns. Plant out antirrhinums (snapdragon), pansies, hollyhocks, verbenas, petunias, &c. Sow zinnias, amaranthus, balsam, chrysanthemum, marigolds, cosmos, coxcombs, phloxes, sweet peas, lupins; and plant gladiolus, tuberose, amaryllis, panchratium, ismene, crinums, belladonna, lily, and other bulbs. In the case of dahlias, however, it will be better to place them in some warm moist spot, where they will start gently and be ready to plant out in a month or two. It must be remembered that this is the driest of our months. During thirty-eight years the average number of rainy days in August was seven, and the mean average rainfall was 2.63 in., and for September 2.07 in., increasing gradually to a rainfall of 7.69 in. in February.

Orchard Notes for August.

THE SOUTHERN COAST DISTRICTS.

The remarks that have appeared in these notes during the last few months respecting the handling and marketing of citrus fruits apply equally to the present month. The bulk of the fruit, with the exception of the latest ripening varieties in the latest districts, is now fully ripe, and should be marketed as soon as possible, so that the orchards can be got into thorough order for the spring growth. All heavy pruning should be completed previous to the rise in the sap; and where winter spraying is required, and has not yet been carried out, no time should be lost in giving the trunks, main branches, and inside of the trees generally a thorough dressing with the lime and sulphur wash.

Where there are inferior sorts of seedling citrus trees growing, it is advisable to head same hard back, leaving only the main trunk and four or five well balanced main branches cut off at about 2 ft. from the trunk. When cut back give a good dressing with the lime and sulphur wash. Trees so treated may either be grafted with good varieties towards the end of the month or early in September; or, if wished,

they may be allowed to throw out a number of shoots, which should be thinned out to form a well balanced head, and when large enough should be budded with the desired variety.

Grafting of young stock in nursery, not only citrus but most kinds of deciduous fruits, can be done this month. It comes in useful in the case of stocks that have missed in budding, but for good clean grown stocks budding is to be preferred.

In the case of working our Seville orange stocks to sweet oranges, grafting is, however, preferable to budding, as the latter method of propagation is frequently a failure. The Seville stock should be cut off at or a little below the surface of the ground. If of small size, a single tongue graft will be sufficient, but if of large size, then the best method is the side graft—two or more grafts being placed in each stock, so as to be certain of one taking. In either case the grafts are tied firmly in place, and the soil should be brought round the graft as high as the top bud. If this is done, there will be few missed, and undesirable Seville stocks can be converted into sweet oranges.

In selecting wood for grafting, take that of the last season's growth that has good full buds and that is well matured; avoid extra strong, or any poor growths.

Seville oranges make good stocks for lemons. In case it is desirable to work them on to lemons, it is not necessary to graft below ground, as in the case of the sweet orange, but the stock can be treated in the same manner as that recommended in the case of inferior oranges—viz., to head hard back, and bud on the young shoots.

Where orchards have not already been so treated, they should now be ploughed so as to break up the crust that has been formed on the surface during the gathering of the crop, and to bury all weeds and trash. When ploughed, do not let the soil remain in a rough, lumpy condition, but get it into a fine tilth, so that it is in a good condition to retain moisture for the trees' use during spring. This is a very important matter, as spring is our most trying time, and the failure to conserve moisture then means a failure in the fruit crop to a greater or lesser extent.

Where necessary, quickly acting manures can be applied now. In the case of orchards, they should be distributed broadcast over the land, and be harrowed or cultivated in; but in the case of pines they should be placed on each side of the row, and be worked well into the soil.

The marketing of pines, especially smooths, will occupy growers' attention, and where it is proposed to extend the plantations the ground should be got ready, so as to have it in the best possible condition for planting, as the thorough preparation of the land prior to planting pines is money very well spent.

The pruning of all grape vines should be completed, and new plantings can be made towards the end of the month. Obtain well-matured, healthy cuttings, and plant them in well and deeply worked land, leaving the top bud level with the surface of the ground, instead of leaving 6 or 7 in. of the cutting out of the ground to dry out, as is

often done. You only want one strong shoot from your cutting, and from this one shoot you can make any shaped vine you want. Just as the buds of the vines begin to swell, but before they burst, all varieties that are subject to black spot should be dressed with the sulphuric acid solution—viz., three-quarters of a pint of commercial sulphuric acid to one gallon of water; or, if preferred, this mixture can be used instead—viz., dissolve 5 lb. of sulphate of iron (pure copperas) in one gallon of water, and when dissolved add to it half a pint of sulphuric acid.

THE TROPICAL COAST DISTRICTS.

Bananas should be increasing in quality and quantity during the month, and though, as a rule, the fruit fly is not very bad at this time of the year, still it is advisable to take every care to keep it in check. No over-ripe fruit should be allowed to lie about in the gardens, and every care should be taken to keep the pest in check when there are only a few to deal with, as, if this is done, it will reduce the numbers of the pest materially later on in the season. The spring crop of oranges and mandarins will be now ready for marketing in the Cardwell, Tully, Cairns, and Port Douglas districts. For shipping South see that the fruit is thoroughly sweated, as unless the moisture is got rid of out of the skins the fruit will not carry. Should the skins be very full of moisture, then it will be advisable to lay the fruit on boards or slabs in the sun to dry; or, if this is not possible, then the skin of the fruit should be artificially dried by placing same in a hot chamber, as the moisture that is in the skin of our Northern-grown citrus fruits must be got rid of before they will carry properly.

Papaws and granadillas should be shipped South, and the markets tested. If carefully packed in cases holding only one layer of fruit, and sent by cold storage, these fruits should reach their destination in good order. Cucumber and tomato shipments will be in full swing from Bowen. Take care to send nothing but the best fruit, and don't pack the tomatoes in too big cases, as tomatoes always sell on their appearance and quality.

THE SOUTHERN AND CENTRAL TABLELANDS.

All fruit-tree pruning should be finished during the month, and all trees should receive their winter spraying of the lime and sulphur wash.

All new planting should be completed, orchards should be ploughed and worked down fine, and everything got ready for spring.

In the warmer parts, grape pruning should be completed, and the vines should receive the winter dressing for black spot. In the Stanthorpe district grape pruning should be delayed as late as possible, so as to keep the vines back, as it is not early but late grapes that are wanted, and the later you can keep your vines back the better chance they have of escaping spring frosts.

Towards the end of the month inferior varieties of apples, pears, plums, &c., should be worked out with more desirable kinds; side, tongue, or cleft grafting being used. In the case of peaches, almonds, or nectarines, head back and work out by budding on the young growth.

LIST OF AGRICULTURAL, HORTICULTURAL, AND PASTORAL SOCIETIES AND ASSOCIATIONS IN QUEENSLAND.

Societies and associations desirous of being registered and placed on the above list must make application to that effect, and forward to the Under Secretary for Agriculture and Stock the following particulars:—

Number of members who have paid their subscriptions for 1912.

Number of meetings held by the Society during 1912.

Date of the last meeting.

Name of the Secretary for 1913.

It is equally necessary that prompt notice be given to the Editor of changes in the Secretaryship of any Society or Association, a matter which is much neglected. Furthermore, information concerning dates on which shows are to be held must be forwarded to the Editor at least six weeks before the Show date. If these suggestions are not complied with, the Society whose Secretary neglects to supply the required information will be liable to be struck off the list of Societies published monthly in the Journal.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates	
			1914	1915.
Allora ...	Central Downs Agricultural and Horticultural Association	J. C. Marshall ...	17 and 18 Feb.	17 and 18 Feb.
Aloomba, <i>via</i> Cairns	Aloomba Farmers' Association ...	Hugh A. Niven ...		
Amberley ...	Amberley Farmers' Progress Association	J. T. Goldsborough		
Atherton ...	Atherton Agricultural, Pastoral, and Industrial Association	H. McKnight ...		
Atherton ...	Atherton Table Land Agricultural Society	H. McKnight ...	...	22 and 23 Sept.
Ayr ...	Lower Burdekin Farmers' Association	R. W. Edwards ..		
Ayr ...	Lower Burdekin Pastoral, Agricultural, and Industrial Association	C. G. M. Boyce ...	11 and 12 June	
Bajool ...	Bajool and Ulam Farmers' Progress Association	A. T. Mitchell ...		
Ban Ban, <i>via</i> Byrnestown	Dundar Branch of the Queensland Farmers' Union	Geo. Gwynne ...		
Barcaldine ...	Barcaldine Pastoral Agricultural and Horticultural Association	W. J. P. Chambers		
Beaudesert	Logan and Albert Agricultural and Pastoral Society	M. Selwyn Smith	12 and 13 May	11 and 12 May
Beenleigh ...	Agricultural and Pastoral Society of Southern Queensland	Capt. C. G. Gehrman	3 and 4 Sept.	23 and 24 Sept.
Beenleigh ...	Logan Farmers' and Industrial Association	Wm. G. Winnett ...		
Beerwah ...	Coochin Creek District Agricultural and Progress Association	E. F. Jones ...		
Belli ...	Belli Creek Farmers' Progress Association	W. E. Neumann ..		
Berwen ...	Haughton River Farmers' Association	James Griffith ...		
Biggenden ...	Biggenden Agricultural and Pastoral Society	C. J. Stephensen ..	9 and 10 July	22 and 23 June
Bin Bin, <i>via</i> Gooroolba	Bin Bin Farmers and Settlers' Association	Milo Burke ...		
Blackall ...	Barcoo Pastoral Society ...	C. M. Pegler ...		
Blenheim ...	Blenheim and District and Farmers' Progress Association	W. A. Zerner ...		
Blythedale ...	Blythedale Agricultural Progress Association	J. L. Quinn ...		
Boonah	Fassifern and Dugandan Agricultural and Pastoral Association	J. McKenzie ...	20 and 21 May	19, 20, and 21 May
Boowoogum...	Brooyar Farmers' Progress Association	Jas. Cahill ...		
Bowen ...	Bowen Farmers' Association ...	H. Reye ...		
Bowen ...	Bowen Pastoral, Agricultural and Mining Association	F. Sellars ...	22, 23, and 24 July	

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1914.	1915.
Brisbane ...	The Queensland Dairy Herd Book Society	Alfred Gorrie ...		
Brisbane ..	National Agricultural and Industrial Association of Queensland	J. Bain	10 to 15 Aug.	9 to 14 Aug.
Brisbane ...	Queensland Chamber of Agricultural Societies	J. Bain		
Brisbane	Horticultural Society of Queensland	F. W. Woodroffe ...		
Bucca, <i>vid</i> Bundaberg	United Farmers' Association ...	I. H. Hendy ...		
Buderim	Buderim Branch of the Queensland Farmers' Union	Capt. G. Burrows ..		
Mountain	Bundaberg Agricultural, Pastoral, and Industrial Society	Redmond Bros. ...	3 and 4 Sept.	9 and 10 Sept.
Bundaberg ...	Canegrowers' Union of Australia (Woongarra Branch)	O. H. Klotz ...		
Bundaberg ...	Woongarra Canegrowers' Association (A.S.P.A. Branch)	G. O. Strathdee ...		
Bunerba, Deeford (<i>vid</i> Westwood)	Bunerba Farmers' Progress Association	H. J. Barnes ...		
*Burrum ...	Burrum District Farmers' and Fruit-growers' Association	S. E. Tooth ...		
Byrnestown...	Byrnestown Farmers and Dairy-men's Progress Association	Geo. H. Bomford ...		
Caboolture ...	Caboolture Pastoral, Agricultural, and Industrial Society	C. V. Hemming ...	1 May	29 and 30 April
Cairns ...	Cairns Agricultural, Pastoral, and Mining Association	H. McMahon ...		
Cairns ...	Cairns Horticultural Society ...	R. Tweedie ...		
Cedar Pocket, Gympie	Cedar Pocket Farmers' Association..	W. A. Fraser ...		
Charleville ..	Central Warrego Pastoral and Agricultural Association	T. C. Fallis ...	4 and 5 May	
Charters Towers	Charters Towers Pastoral, Agricultural, and Mining Association	A. H. Pritchard ...	1 and 2 July	6 to 8 July
Charters Towers	The Towers Horticultural Society ...	Jas. H. Chappel ...	19 and 20 August	25 and 26 August
Chatsworth ...	Chatsworth Combined Farmers' Association	F. W. Johns ...		
Chatsworth...	Chatsworth Farmers' Progress Association	W. Allen ...		
Childers ...	Childers Pastoral, Agricultural, and Industrial Society	J. R. Wrench ...	18 and 19 June	10 and 11 June
Childers	Doolbi Canegrowers' Association ...	R. S. Rankin ...		
Chinchilla ...	Conaga Farmers' Progress Association	G. H. Rochester ...		
Chinchilla ..	Pelican Farmers and Settlers' Association	H. K. Nevell ...		
Chinchilla ...	Chinchilla Agricultural and Pastoral Association	B. Mackie ...	14 and 15 April	6 and 7 April
Clermont ...	Peak Downs Pastoral, Agricultural, and Horticultural Society	A. S. Narracott ...	23 and 24 June	
Clifton ...	Darling Downs Pastoral, Agricultural and Industrial Association	S. C. Mott ...	30 Sept. and 1 Oct.	22 and 23 Sept.
Coochin ...	Coochin Farmers' Progress Association	W. Watson ...		
Cooktown ...	Cooktown District Pastoral, Agricultural, Mining, and Industrial Association	E. A. S. Olive ...	1 and 2 July	
Cooroy ...	Cooroy West Farmers' Progress Association	O. M. Proll ...		
Cooroy ...	Mount Cooroy Progress and Farmers' Association	L. H. Baldwin ...		
Coulson ...	Coulson Farmers' Progress Association	Gustav A. Lewald ...		
Coulstoun, <i>vid</i> Biggenden	Coulston Lakes Branch of the Queensland Farmers' Union	P. E. Britnell ...		
Crow's Nest	Crow's Nest Agricultural, Horticultural, and Industrial Society	James Gleeson ...	28 and 29 April	6 and 7 April
Dalby ..	Northern Downs Pastoral and Agricultural Association	W. R. Hunter ...	26 and 27 May	21 and 22 April

* Monthly meetings held alternately at Burrum and Howard.

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1914.	1915.
Dallarnil ...	Dallarnil Farmers and Dairymen's Association	H. J. Piper ...		
Didcot ...	Didcot Farmers and Settlers' Association	Fred. Jones ...		
Deeford, (Dawson Valley)	Dundee Farmers and Settlers' Progress Association	C. G. Young ...		
Degilbo ...	Emu Creek Farmers and Dairymen's Progress Association	J. E. Peterson ...		
Dirran, <i>via</i> Malanda	Dirran Settlers' Progress Association	Percy G. R. Dutton		
Emerald ...	Emerald Pastoral and Agricultural Society	J. Esmond ...	...	26 and 27 May
Esk ...	Esk and Toogoolawah Pastoral, Agricultural, and Industrial Association	Thos. C. Pryde ...	5 and 6 May (at Toogoolawah)	8 and 9 June
Eukey, <i>via</i> Ballandean	Eukey Farmers and Fruit-growers' Association	H. H. Stanton ...		
Evelyn ...	Millsream Farmers and Settlers' Association	H. R. Gardiner ...		
Fairford ...	Fairford Agricultural and Pastoral Association	H. E. Hollins ...		
Fordsdale, <i>via</i> Grantham	Fordsdale Farmers' Association ...	W. M. Ridley ...		
Forest Hill ...	Forest Hill Agricultural and Progress Association	J. Stoddart ...		
Gayndah ...	Philpott Creek Farmers' Progress Society	E. P. Earle ...		
Gayndah ...	Pastoral, Industrial, Agricultural, and Horticultural Association	M. C. Stephensen...	9 and 10 June	22 and 23 June
Gayndah ...	Gleneden Branch of the Queensland Farmers' Union	W. S. Morris ...		
Gayndah ...	Gurgeena Farmers' Progress Association	W. G. Leaver ...		
Gayndah ...	Binjour Farmers' Progressive Association	F. G. Hunter ...		
Gin Gin ...	Currajong and Gin Gin Agricultural, Pastoral, and Industrial Society	C. M. Morris ...	27 and 28 May	17 and 18 June
Gladstone ...	Port Curtis Agricultural, Pastoral, and Mining Association	J. T. W. Brown ...	...	18 and 19 May
Glen Aplin ...	Ballandean Fruitgrowers' Association	W. H. C. Laird ...		
Gooburrum ...	Gooburrum Farmers' and Cane-growers' Association	W. J. Lutin ...		
Goomboorian road <i>via</i> Gympie)	Ross and Mullin's Creek Farmers' Progress Association	R. E. Kitchen ...		
Goombungee	Goombungee Agricultural, Horticultural and Pastoral Society	J. J. Morgan ...	...	24 March
Goondiwindi	Comeron-Moorobie Farmers' Progress Association	J. Johnston ...		
Goondiwindi	MacIver Pastoral and Agricultural Society	E. T. Drake ..	29 and 30 April	
Gooroolba ..	Gooroolba Farmers and Settlers' Progress Association	H. A. Harrison ...		
Grantham ...	Ma Ma Creek Farmers' Progress Association	A. McKenzie ...		
Gympie ...	Agricultural, Mining, and Pastoral Society	F. W. Shepherd ...	9 and 10 Sept.	1 and 2 Sept.
Gympie (Goomboorian road)	The Veteran and Scrubby Creek Farmers' Progress Association	T. T. Ramskill ...		
Hambledon (Cairns)	Hambledon Cane Farmers' Association	F. C. P. Curlewis		
Hawthorn (Daymar Siding)	Weengallon Farmers and Settlers' Progress Association	Laurence A. Seeger		
Helidon ...	Flagstone Creek Branch of the Queensland Farmers' Union	Fred Tuffrey ..		
Herberton ...	Herberton Mining, Pastoral, and Agricultural Association	Richard Barton ...	13 and 14 April	5 and 6 April

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1914.	1915.
Hughenden ...	North Western Queensland Pastoral and Agricultural Association	H. P. Blackall ...	11 and 12 May	
Ingham ...	Herbert River Pastoral and Agricultural Association	R. L. Jones ...	4 and 5 Sept.	17 and 18 Sept.
Inglewood ...	Inglewood Agricultural, Pastoral, and Horticultural Society	J. F. Cheshire ...	19 and 2 March	24 and 25 March
Inkerman (Lower Burdekin)	Inkerman Farmers and Graziers' Association	L. M. Osborne ...		
Innisfail ...	Johnstone River Canegrowers and Manufacturers' Association	Ralph Reid ...		
Innisfail ...	Johnstone River Agricultural Society	T. Nesbet ...		
Ipswich ...	The Queensland Pastoral and Agricultural Society	G. W. Allen ...	27 and 28 May	26 and 27 May
Ipswich ...	Ipswich Horticultural Society	Hugh Parkinson ...		
Jackson (Western Line)	Parish Woleebee Settlers' Association	S. C. Griffin ...		
Jardine ...	Jardine Farmers' and Fruitgrowers' Association	R. Lemain ...		
Juandah ...	Juandah Dairy and Progress Association	R. Bowie ...		
Kamma (Cairns)	The Cairns Canegrowers' Association	C. V. Hives ...		
Kenmore ...	Brookfield, Pullen Vale, and Moggill Farmers' Association	F. B. Howard ...		
Kilcoy ...	Kilcoy Pastoral, Agricultural, and Industrial Society	W. E. Reason ...	14 and 15 May	6 and 7 May
Kilkivan ...	Kilkivan Pastoral, Agricultural, and Industrial Association	F. E. Hopkins ...	2 July	9 and 10 June
Killarney ...	Killarney Agricultural Society	L. W. Wilkinson ...	...	24 and 25 Feb.
Kingaroy ...	Agricultural, Pastoral, and Industrial Society	R. A. Pearce ...	20 and 21 May	24 and 25 March
Kin Kin, <i>via</i> Cooran	Kin Kin and District Farmers' Progressive Association	A. C. Stewart ...		
Kooroongarra <i>via</i> Inglewood	Kooroongarra Farmers' Progress Association	J. French ...		
Laidley ...	Farmers' Progress Association	G. A. Moulday ...		
Laidley ...	Lockyer Agricultural and Industrial Society	F. Roberts ...	...	21 and 22 July
Lake Clarendon (<i>via</i> Gatton)	Lake Clarendon Branch of the Queensland Farmers' Union	W. J. Walton ...		
Lockrose ...	Lockrose and District Farmers' Progress Association	R. W. L. Raymont		
Longreach ...	Longreach Pastoral and Agricultural Society	A. Petersen ...	4 and 5 May	
Lowood ...	Lowood and Tarampa Pastoral and Agricultural Association	W. E. Michel ...	13 and 14 May	11 and 12 May
Mackay ...	Pioneer River Farmers and Graziers' Association	T. J. Leonard ...	23 and 24 June	
Mackay ..	The Pioneer River Farmers and Graziers' Show Association	T. J. Leonard ...	...	22 and 23 June
Macnade, <i>via</i> Lucinda	Macnade Farmers' Association	E. S. Waller ...		
Malanda ...	Millaa Millaa Settlers' Progress Association	S. S. Buckley ...		
Mapleton ...	Mapleton Fruitgrowers and Farmers' Progress Association	J. G. Smith ...		
Marburg ...	Marburg and District Agricultural and Industrial Association	A. H. Bielefeld ...	2 and 3 June	2 and 3 June
Mareeba ...	Mareeba District Mining, Pastoral, Agricultural, and Industrial Association	W. A. Ferguson ...	25 and 26 May	
Maryborough	Wide Bay and Burnett Pastoral and Agricultural Society	H. A. Jones ...	2, 3, and 4 June	1, 2, and 3 June

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1914.	1915.
Miles ...	Miles District Agricultural and Pastoral Society	T. P. Goonan ...	...	21 April
Minehan's Siding, <i>via</i> Townsville	Haughton River Farmers' Association	W. E. G. Smith ...		
Mitchell ...	Maranoa Pastoral, Agricultural, and Industrial Association	Neil Hammond ...	12 and 13 May	11 and 12 May
Mondure, <i>via</i> Wondai	Mondure Farmers and Dairymen's Association	G. E. Compagnoni		
Montville ...	Montville Fruitgrowers and Farmers' Progress Association	F. W. Thompson ...		
Mooloolah ...	Mooloolah and Glenview Farmers' Progress Association	William Ellison ...		
Mount Larcom (Gladstone)	Wilmott Farmers' Progress Association	J. J. Kelly ...		
Mount Larcom	Mount Larcom Farmers' and Cane-growers' Association	R. R. Nöthling ...		
Mt. Marshall, <i>via</i> Allora	Mount Marshall Farmers' Progress Association	J. Rooney ...		
Mullet Creek	Mullet Creek Farmers' Association...	G. Lee ...		
Mundowran	Mundowran Pocket Farmers' Association	E. Canty ...		
Mundubbera	Mundubbera Farmers and Settlers' Progress Association	W. G. Parker ...		
Murgon ...	Murgon Branch of the Queensland Farmers' Union	W. D. Davidson ...		
Murray's Creek	Murray and Baffle Creek Progress and Farmers' Association	T. J. Gee ...		
Nambour ...	Maroochy Pastoral, Agricultural, Horticultural, and Industrial Society	A. H. Bushnell ...	8 and 9 July	21 and 22 July
Namboir ...	Bli Bli Farmers and Fruitgrowers' Progress Association	F. Pashen ...		
Nanango ...	Nanango Agricultural, Pastoral, and Mining Society	W. Selby ...	27 and 28 May	23 and 24 Sept.
Nerang ...	Southern Queensland and Border Agricultural and Pastoral Association	Edgar J. Foote ...		
North Arm, N. C. Railway	North Arm Farmers' Progress Association	J. F. Fountain ...		
North Pine ...	The Pine Rivers Agricultural, Horticultural, and Industrial Association	G. W. Armstrong...	25 and 26 June	25 and 26 June
Oakey ...	Oakey Agricultural and Pastoral Society	Alan B. Stanley ...	9 Sept.	
Oakey Creek, <i>via</i> Eumundi	Kenilworth Farmers' Association ...	Harry Pickering ...		
Okeden, <i>via</i> Wondai	Proston, Okeden, and Wigtoun Settlers' Association	R. McNamara ...		
Oman-ama ...	Redbank Farmers' Progress Association	W. K. Ison ...		
Palmwoods ...	Queensland Farmers' Union (Palmwoods Branch)	W. Browne ...		
Palmwoods ...	Palmwoods Progress and Fruit-growers' Association	Hugh McVair McKay		
Pickanjenie	Pickanjenie Farmers' Progress Association	J. Proud ...		
Pittsworth ...	Pittsworth Pastoral, Agricultural, and Horticultural Association	W. O. Hare ...	28 Jan.	27 Jan.
Pomona ...	Noosa Agricultural, Horticultural, and Industrial Society	W. B. Smith ...	4 and 5 Nov.	17 and 18 Nov.
Proserpine ...	Proserpine Farmers and Canegrowers' Association	W. B. Caswell ...	17 July	
Ravenshoe ...	Ravenshoe Farmers and Graziers' Progress Association	W. R. Soilleux ...		
Roche Creek, <i>via</i> Miles	Roche Creek Farmers' Progress Association	G. F. Smith ...		
Rockhampton	Alton Downs Farmers' Association...	G. T. Crook ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1914.	1915.
Rockhampton	Rockhampton Agricultural Society...	H. Hill	18, 19, and 20 June	27, 28, and 29 May
Rockhampton	Jardine Farmers and Fruitgrowers' Progress Association	R. Lamain		
Rockhampton	Fitzroy Farmers' Progress Association	T. Ritchie		
Roma	Western Pastoral and Agricultural Association of Queensland	H. M. Campbell ...	19 and 20 May	20 and 21 July
Roma ...	Euthulla and Upper Bungil Farmers and Settlers' Association	John J. Maun		
Rosewood ...	Rosewood Agricultural and Horticultural Association	A. J. Loveday	29 and 30 July	28 and 29 July
Sexton ...	Sexton Farmers and Settlers' Progress Association	W. K. Harvey		
Speedwell, <i>via</i> Stalworth	Speedwell Farmers' Progress Association	Aubray U. Potter		
Springsure ...	Springsure Pastoral and Agricultural Society	W. Fisher	13 and 14 May	12 and 13 May
St. George .	Balonne Pastoral and Agricultural Association	Mark Roberts		
Stanthorpe ...	Stanthorpe Agricultural Society ...	A. E. Bateman ... ..	...	3, 4, and 5 Feb.
Tabragalba ...	Tabragalba and Canungra Farmers' Progress Association	A R. Ludwig		
Takura, <i>via</i> Maryboro'	Takura Farmers' Union	S. E. Tooth		
Teutoberg ...	Teutoberg Farmers' Progress Association	E. H. Ochmichen...		
The Caves, <i>via</i> Rock- hampton	Mount Etna Farmers and Selectors' Progress Association	Geo. Smith		
The Gums, <i>via</i> Tara	The Gums and Horse Creek Pastoral and Agricultural Association	Arthur Henry		
Tolga ...	Tolga Forest Farmers' Union ...	H. Northey		
Toowoomba...	Royal Agricultural Society of Queensland	G. Noble	21 to 23 April	13, 14, and 15 April
Toowoomba...	Toowoomba White Growers' Association	A. C. Salmon		
Townsville ...	Townsville Pastoral, Agricultural, and Industrial Association	J. N. Parkes	14 and 15 July	29 and 30 June
Wallumbilla	Wallumbilla Farmers' Association ...	H. A. Watson		
Warwick ...	Eastern Downs Horticultural and Agricultural Association	F. H. Selke	10 to 12 Feb.	9, 10, 11, & 12 Feb.
Wellington Point	Wellington Point Agricultural, Horticultural, and Industrial Association	E. Ziegenfusz	4 July	
Wondai ...	Wondai Agricultural, Pastoral, and Industrial Society	H. J. Compagnoni	13 and 14 May	26 and 27 May
Wondalli, <i>via</i> Goondiwindi	Wondalli-Yelarbon Farmers' Progress Association	L. C. G. Cameron		
Woodend ...	Warren-Woodend Farmers' Club ...	W. Lehfeld		
Woodford ...	Woodford Agricultural, Pastoral, and Industrial Society	G. H. Osmond	28 and 29 May	22 and 23 April
Woombye ...	North Coast Agricultural and Horticultural Society	E. E. McNall	10 and 11 June	23 and 24 June
Woombye ...	Woombye Fruitgrowers' and Progress Association	J. Howe		
Woongarra ...	Woongarra Cane-growers and Farmers' Union	H. A. Cattermull...		
Woowoonga Scrub	Woowoonga Farmers and Cane-growers' Association	Thos. Wilkins		
Yandina ...	Maroochy River Farmers' Union and Progress Association	D. G. Martin		
Yandina Creek <i>via</i> North Arm, N.C. Line	Yandina Creek Farmers and Settlers' Progress Association	J. D. Benfer		
Yingerbay ...	Yingerbay Dairymen and Farmers' Association	R. Frederick		
Zillmere ...	Zillmere Agricultural, Horticultural, and Industrial Society	Arthur B. Marquis	3 Oct.	18 Sept.

Departmental Announcements.

The Editor will be glad to receive any papers of special merit which may be read at meetings of Agricultural and Pastoral Associations in Queensland, reserving, however, the right to decide whether their value and importance will justify their publication.

Secretaries of Associations are requested to be good enough to forward to the Editor, as early as possible, the dates of forthcoming Shows, as it is important in the interests of the Associations that these dates should be published.

It is equally necessary that prompt notice be given to the Editor of changes in the Secretaryship of any Society or Association, a matter which is much neglected. Furthermore, information concerning dates on which shows are to be held must be forwarded to the Editor at least six weeks before the Show date. If these suggestions are not complied with, the Society whose Secretary neglects to supply the required information will be liable to be struck off the list of Societies published monthly in the Journal.

To enable recipients of the *Queensland Agricultural Journal* to have the half-yearly volume bound, Covers in Boards and Cloth will be supplied from this Office on application to the Under Secretary for Agriculture. Applications must be accompanied by a remittance to cover cost. Covers will be supplied at ONE SHILLING and ONE SHILLING AND NINEPENCE each.

In order to avoid disappointment, correspondents who wish for replies to questions in the Journal are requested to note that it is imperative that all matter for publication on the first day of any month should reach the Editor by the 15th of the previous month.

Persons desiring to communicate with the Queensland Agricultural College and State Farms are requested to address their correspondence to the Principal of the College, Gatton, and to the Managers of the State Farms. The State Farms are: Hermitage (Warwick), Gindie (*viâ* Springsure), Warren (Stanwell), Bungeworgorai (Roma), Kairi (Tolga), Kamerunga State Nursery (Cairns).

We would ask our Subscribers to note that, when their Subscription has run out, a RED CROSS is placed against the Order Form. It often happens that this intimation is disregarded, with the result that the JOURNAL is NOT POSTED to the Subscriber. The Department cannot guarantee to supply back numbers in such cases.

It is notified, for the information of intending Visitors to the Queensland Agricultural College, that the Second Wednesday in each month has been set apart for the reception of Parties of Farmers and others desirous of inspecting the Institution. Supplies of hot water and milk can be obtained at the College, if desired.

The Department has now prepared a booklet on "Flower Gardening for Amateurs," which may be obtained on application to the Under Secretary for Agriculture and Stock. Price, TWO SHILLINGS.

PAMPHLETS on different subjects relating to Agriculture, Horticulture, and Stock are issued by the Department, and may be obtained gratis, on application to the Under Secretary.

NOTICE OF SHOW DATES.

We wish to draw the attention of Secretaries of Agricultural and Pastoral Societies and Associations to the importance of promptly notifying the Editor of any change in the dates on which shows are to be held.

NOTICE.

All communications in connection with the Journal, inquiries, &c., should be addressed to "The Editor" only. Letters addressed personally are liable to delay in reply.

No replies can be given to Anonymous letters. The writers are requested to sign their communications, not necessarily for publication.

QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

FOR SALE.

GRASS ROOTS.—*Paspalum* and *Rhodes*.

POULTRY DEPARTMENT.

The College has for sale Poultry of the following breeds:—Brown Leghorn, White Leghorn, Silver-Grey Dorking, Indian Game, Plymouth Rock, Black Orpington, Buff Orpington, Silver-Laced Wyandotte, and White Wyandotte.

PRICES.

Cockerels, 10s., 15s., and 21s., f.o.b., Gatton.

Pairs—Cockerel and Pullet—30s. and 42s., f.o.b., Gatton.

Trios—Cockerel and Two Pullets—42s. and 63s., f.o.b., Gatton.

Prices vary, as above stated, according to quality. Additional charges of 2s. for a single bird and 1s. for each additional bird will be incurred by purchasers who fail to return crates promptly.

Eggs of the above breeds are offered for sale during the season, 1st July to 30th November. Price, 10s. per setting of twelve, F.O.B., Gatton. Nine eggs in each setting are guaranteed fertile. Should less than nine prove to be fertile, the infertiles will be replaced, if returned, carriage paid, and unbroken.

(N.B.—An infertile egg is uniformly translucent when held up to a strong light. Settings should be allowed to settle 24 hours before being placed under the hen.)

In cases where eggs cannot be sent otherwise than by parcel post, sixteen eggs will be sent to a setting, and no responsibility will be taken in connection with the replacing of any eggs which fail to hatch.

Applications for birds or eggs should be accompanied by remittance and addressed to the Principal, Agricultural College, Gatton.

The following Stud Animals are available for Service at the College Farm:—

AYRSHIRE—

Netherton King George, Imported. Sire: Netherton King Arthur.

Dam: Midland Young Greenfield.

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“The Fruit Cases Act of 1912.”

Attention is drawn to the Regulations under this Act which come into force on the 1st June, 1915, and it is notified that on and after that date fruit that is sold in cases or is exported to any place within the Commonwealth must be in cases of the dimensions mentioned below. Bananas are excepted from the operations of the Queensland Act.

The sizes of the fruit cases required in New South Wales are of the same dimensions as those in the Queensland Act. The New South Wales Regulations are already in force.

Any case must be of one of the following **inside** measurements, **clear of any divisions**.

				LENGTH. inches.	DEPTH. inches.	WIDTH. inches.
(1)	1 bushel	..	..	18	14 $\frac{1}{4}$	8 $\frac{2}{3}$
(2)	do.	..	..	26	14 $\frac{1}{4}$	6
(3)	do.	..	..	20	10	11 $\frac{1}{2}$
(4)	$\frac{1}{2}$ bushel	..	..	18	7 $\frac{1}{2}$	8 $\frac{2}{3}$
(5)	do.	..	..	26	7 $\frac{1}{2}$	6
(6)	do.	..	..	18	5 $\frac{1}{4}$	11 $\frac{3}{4}$
(7)	$\frac{1}{4}$ bushel	13 $\frac{3}{4}$	4	10 $\frac{1}{2}$
(8)	Tropical Fruit Case (for Pineapples, etc.)			24 $\frac{3}{4}$	12	12

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1. All cases for the Queensland trade must be new or clean and free from insect or fungus diseases.

2. New cases only must be used for fruit exported to any of the other Australian States.

3. New cases only must be used (under any circumstances) in the fruit districts of Stanthorpe and Bowen.

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Every case, whether the fruit is for sale in Queensland or in another Australian State, must have legibly and durably on one end of the outside of the case:—

1. The name and address of the packer of the case.

2. The words “guaranteed by packer to contain 1 Imperial bushel” or as the size of the case may warrant.

In the case of the Tropical Fruit Case the guarantee should be—
“Guaranteed by maker to contain not less than 3,564 cubic inches.”

The above name, address, and guarantee should be at least 5 inches long and 2 inches wide; but stamps 3 inches by 1 $\frac{1}{2}$ inches and upwards will be accepted.

Exception.

The Act will not apply to the sale of fruit sold in trays, baskets, casks, or buckets, or to crates which contain trays of fruit. Fruit so packed, however, must have marked on the package the weight or number of its contents.

Contraventions.

Penalties are provided for persons who—

1. Pack fruit for the Queensland trade in disease-affected cases.
2. Export fruit to another Australian State in second-hand cases.
3. Obstruct or refuse to give information to an Inspector who is carrying out the Act.
4. Place an incorrect guarantee on a case.
5. Export fruit in a case carrying an incorrect guarantee.
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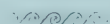
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[SEPT., 1915.]

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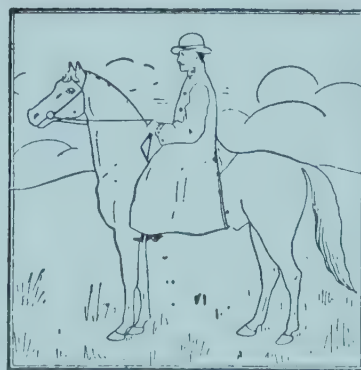
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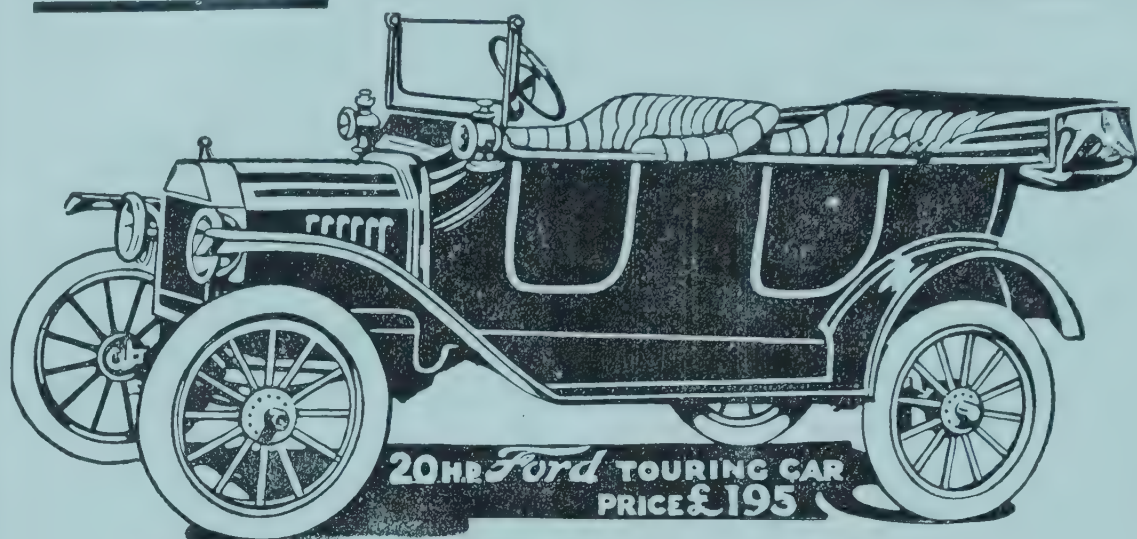
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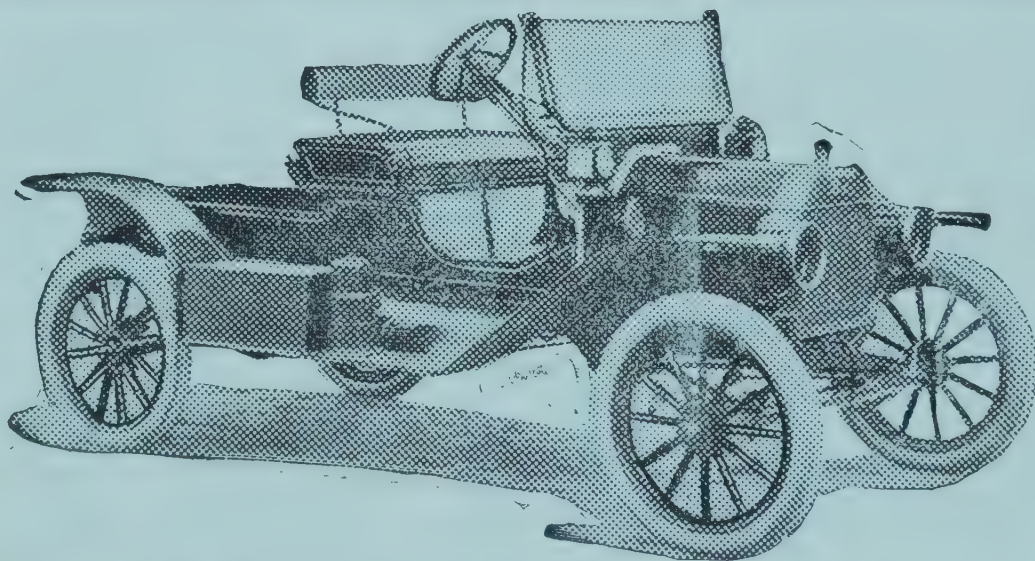


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THE LATE MR. F. M. BAILEY, C.M.G., F.L.S.

The accompanying portrait of the late much-esteemed Colonial Botanist, Mr. F. M. Bailey, was, owing to an oversight, omitted in our August issue. Mr. Bailey always wished to retain his original title of "Colonial," in preference to "Government," Botanist.

[*Frontispiece.*

QUEENSLAND AGRICULTURAL JOURNAL

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PART 3.

Agriculture.

COMPLETE FERTILISERS FOR FARM, ORCHARD, AND VEGETABLE GARDENS.

CUCUMBERS.

This vegetable may be grown on almost any soil, as long as it is fairly light and loamy, and plenty of manure is added. The pits or hills should be prepared by mixing a large amount of well-rotted stable manure, sheep or fowl dung, ashes, and bonedust with the soil.

Apply in addition the following artificial fertilisers:—

3 to 4 cwt. of superphosphate	} per acre;
1½ to 2 cwt. of sulphate of potash	
1½ cwt. of sulphate of ammonia or nitrolim	

or the same amounts in pounds to every 43 square yards.

An excessive amount of nitrogenous manure, more particularly in

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the form of quick-acting nitrates, may cause an excessive growth of vines and poor quality of cucumbers.

LEEKs and ESCHALOTS.

These vegetables require a deep, rich, sandy loam, a liberal manuring with stable manure, ashes, bonedust, &c., when preparing the bed, and a copious supply of liquid manure during their growth.

A complete fertiliser is made up as follows:—

4 to 6 cwt. superphosphate	} per acre;
1 to 1½ cwt. sulphate of potash	
2 to 3 cwt. sulphate of ammonia or nitrolim	

or the same quantities in pounds to every 43 square yards.

LETTUCE.

Lettuce requires a rich loam, in order to grow very quickly, and in good soil the addition of artificial fertilisers will produce large crisp plants.

Use per acre 8 to 12 cwt., or per square yard 3 to 4 oz., of a fertiliser containing 6 to 8 per cent. phosphoric acid, 4 to 6 per cent. nitrogen, and 8 to 10 per cent. potash; or the following mixture:—

4 to 6 cwt. superphosphate	} per acre.
1½ to 3 cwt. sulphate of potash	
2 to 4 cwt. nitrolim or sulphate of ammonia	

LUCERNE.

Lucerne, one of our most valuable fodder-plants, grows well on rich loams, and clayey soils, containing plenty of lime, and having a mellow, fairly open, or even gravelly subsoil. Clayey soil, deficient in lime, may be made to grow lucerne if the land is heavily limed with ground limestone, at the rate of one to three tons per acre. Some light sandy soil, with a clayey or gravelly subsoil, may also be made fit for lucerne by liming. Nitrogenous manure is, as a rule, not required, but a small dressing with nitrolim or nitrate of lime, at the rate of ½ to 1 cwt. per acre, at the time of sowing, may act as a stimulus and give the plants a chance to establish themselves in poorer soils. The plant requires an ample supply of potash and phosphoric acid, and an annual application of 3 to 6 cwt. of a fertiliser mixture, containing 6 to 8 per cent. phosphoric acid and 10 per cent. of potash, is to be recommended.

The following manures may be applied broadcast every year:—

2 to 3 cwt. superphosphate	} per acre;
1 to 1½ cwt. sulphate of potash or muriate of potash	
or,	
3 to 4 cwt. Thomas phosphate	} per acre
1½ to 3 cwt. kainit	

MANGOLDS and SWEDES.

Mangolds, like Swedes and beets, are a very exhaustive crop and require a fairly rich loamy soil. Whenever possible from 10 to 20 tons of well-rotted farmyard manure should be applied, per acre, when

preparing the land for sowing. This crop is one of the few which prefers the potash in the form of chloride or muriate, and if the usual sulphate of potash is used, an equal amount of common salt may be added. The following mixture of artificial fertiliser will be found to give greatly increased crops:—

2 to 3 cwt. superphosphate	} per acre;
1 to 1½ cwt. muriate of potash	
2 cwt. nitrolim or sulphate of ammonia	

or,

2 to 3 cwt. superphosphate	} per acre.
1 cwt. sulphate of potash	
2 cwt. common salt	
2 cwt. nitrolim or sulphate of ammonia	

MARROWS, PUMPKINS, and SQUASHES.

Marrows do best on a fairly rich loamy soil, with a stiff subsoil, and many of our scrub soils are particularly suitable for these vegetables. With the aid of artificial fertilisers they may be grown on lighter soil, in which case the amount of artificial fertiliser may be increased up to 8 and 10 cwt. per acre or 8 to 10 lb. to every 43 square yards.

The following mixed fertiliser will be found suitable:—

3 to 4 cwt. superphosphate	} per acre.
1½ cwt. sulphate of potash	
1½ to 2 cwt. nitrolim or sulphate of ammonia	

OATS.

This cereal may be grown on almost any class of soil, but requires a fairly cool and moist climate.

When grown on a soil of average quality apply per acre from 3 to 5 cwt. of a mixed fertiliser containing from 6 to 8 per cent. water-soluble phosphoric acid, 8 per cent. of potash, and 4 to 5 per cent. nitrogen, or the following mixture:—

1½ to 3 cwt. superphosphate	} per acre.
½ to 1 cwt. sulphate of potash	
½ to 1 cwt. nitrolim or sulphate of ammonia	

LAYING OF WHEAT.

By BENJAMIN WILSON.

Some farmers, in their eagerness to obtain as big a wheat crop as possible, plant their seeds as close as they possibly can; with the result that light cannot pass between the plants and the stems become long and slender. The stems are thus no longer able to support the weight of the ears of corn and "laying" results. For the healthy growth of wheat a certain intensity of light is essential. The light acts directly on the protoplasm and gives to it some of the energy it utilises in constructive metabolism; thus it exerts a tonic influence on

the development of the cornstalk. Without entering into detailed botanical explanations, it may be said that while light is not absolutely essential for growth it is still necessary for healthy growth. Plants will grow faster in the dark than in the light, as may be seen in rhubarb, which when forced in the dark has small leaves and long slender stems. When grown in the light, the stem of rhubarb is short and thick. Speaking generally, it may be said that most plants grown in the dark have soft stems, which are very much elongated and sickly in colour.

Plants grow more rapidly during the night than during the day. During daylight food formation takes place, and the materials then stored are used up during darkness in producing the permanent change in the plant. From what has been said it will be seen that the remedy for laying of wheat is to widen the distance between each seed. The trouble will then be averted.

STOCK FOODS.

By J. C. BRÜNNICH, Agricultural Chemist.

The dairy farmers of this State have again passed, on account of scarcity and high cost of feed, through an exceedingly trying time, and in a very large number of cases hand feeding had to be resorted to. At such times it is of utmost importance to have some knowledge of the composition of various fodders, and more particularly of the more common commercial concentrated foodstuffs, which will have to be used in connection with poorer foods to keep the stock in good condition. The monetary value of such foods can only be judged by comparing their composition.

A very large number of various grasses, cereals, leguminous crops, grains and seeds, and root crops, have been analysed at our agricultural laboratory from time to time, and the results published in our annual reports. As these reports are not always to hand, I have had prepared a short table of the analysis and composition of the most common stock foods, which appeared in article under the same heading in the "Agricultural Journal" two years ago. Since that time a large number of various grasses, and of common pasture, at different periods of growth, have been analysed, and the variation in composition was found to be very striking,* so that it was considered of more value to average the results of all the analyses in the preparation of the new table.

In the table (Table II.) at the end of this paper the amounts of constituents most important for nutrition contained in every 100 lb.

* Annual Report of Agricultural Chemist, 1914.

of fodder are given under the headings: **Crude Protein, Carbohydrates, Crude Fibre, Crude Fat, and Crude Ash.** Only parts of these constituents become really **available** to the animal by being more or less digestible. Again, we must bear in mind that the various classes of farm stock, and even individual animals of each class, have a greatly varying power of digestion. All ruminants—animals like oxen, cows, sheep, and goats, which chew their cud—digest much larger proportion of the nutriment constituents of foods than non-ruminant animals, like horses, pigs, &c. This variation in digestibility applies more particularly to the coarse and bulky fodders, straws and hay, of which a horse digests much less than a cow or sheep.

Unfortunately, no actual feeding experiments on the digestibility of our stock foods have been carried out in Queensland, and all our calculations of the digestible portions of such foods have to be based on European and American experiments. The **values of digestible** constituents, contained in every 100 lb. of fodder, are calculated (in Table II.) on the average digestion of ruminants, and apply therefore chiefly to the feeding of cows, sheep, &c. The values would be lower when the fodders are used for the feeding of horses and pigs.

When calculating actual rations the values of digestible nutrients have again to be modified, as in all cases a certain amount of energy is required for mastication and digestion itself, and the “**availability**” of a food for actual productive purposes will in many cases be very considerably lowered. Of the digestible nutrients in the more easily digested fodders, like roots, grain, meals, &c., as much as 95 per cent. may be available, but in the case of rough fibrous foods, straw, poor coarse hay, &c., only 30 per cent., or about one-third, of the food is actually made use of, two-thirds of the energy being wasted for mastication and digestion. A liberal extra allowance has therefore to be made when using coarser fodders in the making up of rations. As a matter of fact, when feeding horses with coarse fodder like straw or poor quality of hay, so much energy is consumed in digestion that nothing is left to enable the animal to perform any work.

The nitrogenous compounds, included under the heading “**Crude Proteins,**” are called the **flesh-forming constituents** of food, as their chief function is the production of blood, muscle, and repair of waste tissue. The **nitrogen-free compounds** come under the headings: Carbohydrates (starch and sugars), crude fibre, and crude fat, which all are **heat or energy producers**, and may also form fat.

Every efficient food ration must contain a minimum amount of proteins and a certain amount of total heat or energy producing con-

stituents, and in order to avoid waste of one or the other, a certain ratio, called the **nutritive ratio**, between the amounts of digestible proteins and digestible non-nitrogenous (energy producing) nutrients has to exist in a properly balanced ration. This ratio must be changed in accordance with age and the amount of work to be performed by the animal.

When judging the value of fodder as food for stock we have to consider besides the practical points of succulence, flavour, and palatability, the chemical composition with regard to the amounts of: 1st, nitrogenous constituents; 2nd, heat or energy producing nutrients; 3rd, mineral matter; and, lastly, of water.

The amount of **water**, or rather the ratio between water and total dry food material, is of some importance, cattle requiring a ratio of about 4 to 1, sheep only 2.1, whilst horses, according if they are at rest or working, require ratios of 2.1 to 3.6 to 1. When feeding cattle with dry rations larger amounts of water are required; as soon as roots are fed, the quantity of water required is much less, and when feeding very succulent watery foods, as, for instance, prickly-pear leaves, no water at all need be supplied; in fact, giving water to cattle so fed may be even dangerous.

The **energy value** of a fodder may be measured by the amount of heat evolved on burning, and may also be called **fuel value**. For the calculation of this value, starch is taken as the unit, the other carbohydrates, sugars and fibre, are taken of the same heat value, fat produces 2.3 times the amount of heat, and protein only about $\frac{9}{16}$ the amount. The total amount of energy produced by all the digestible nutrients of a food is also expressed as its **starch value (equivalent)**, and may be used for comparison of the feeding value of the various fodders.

The old feeding standards of *von Wolff* have been slightly modified on the results of more recent feeding experiments carried out by *Professor Kellner*, of the Möckern Experiment Station in Germany, and he applies in his feeding standard principally the starch equivalent of foods for the making up of suitable rations. Carefully conducted trials carried out in Denmark and Sweden, which were made more particularly to ascertain the milk production from certain rations, gave results closely approximating the values based on Kellner's starch equivalents.

In the following short table the actual net available amounts of energy produced by food is taken into account, and all compared with wheat taken as the unit.

Equivalent Quantities of Food.

—				Based on Kellner's Starch Equivalent.	Danish Scale.	Swedish Scale.	Lawe's and Gilbert's Scale.
Wheat	..	..	..	1	1	1	1
Bran	..	..	..	1.5	1	1.1	1.25
Oil Cake	..	..	..	.9 to 1.1	1	.85 to 1	.9 to 1.1
Clover Hay	..	..	..	2.2	2	2.5	2
Meadow Hay	..	..	..	2.3	2.5	2.6	2.1
Mangolds	..	..	..	11	10	10	13
Turnips	..	..	..	15	12	12.5	19
Straw	..	..	..	4.2	4	4	2.5
Green Fodder		..	..	7 to 9	10	7.5 to 11	..
Potatoes	..	..	..	3.8	4	5	8.5

In order to compare this table with the values given in my larger table at the end of this paper, in which the starch equivalent of wheat is taken as 16, meaning that it takes 16 lb. of wheat to supply a cow of 950 to 1,000 lb. live weight with sufficient amount of energy-yielding nutrients for the production of 25 lb. of milk daily, we find, for instance, straws to have a starch equivalent from 23 to 28 lb., thus requiring theoretically from 1½ to 2 times the weight, as compared with weight of wheat, to supply the necessary amount of carbohydrates or fuel value.

As already stated, a large amount of energy is wasted in the mastication and digestion of straw, and therefore according to Kellner's and other practical tests, straw must be actually fed about 4 times the amount of wheat to produce the same energy. In the case of more digestible foods the difference between our theoretical starch values and Kellner's available starch equivalent will seem much smaller, and we find, for instance, that they practically agree in the case of bran, oilcakes, and potatoes.

For the actual calculation of rations for farm stock we must now take Table I. of "Kellner's Standard Rations," which we find gives values slightly lower than those given in von Wolff's table previously published. Again, in the case of two values being given we may safely assume that with our more favourable climatic conditions the lower value will suffice for the rations of our stock.

TABLE I.
Kellner's Standard Rations.
PER 1,000 LB. LIVE WEIGHT PER DAY.

Animal.	Dry Matter in Total Ration.	DIGESTIBLE.	
		Protein.	Starch Equivalent.
Horse (light work)	18-23	1.0	9.2
Horse (medium work)	21-26	1.4	11.6
Horse (heavy work)	23-28	2.0	15.0
<i>Fattening Cattle—</i>			
At 550 lb. live weight	26	2.8	14.4
At 770 lb. „ „	26	2.2	11.2
At 950 lb. „ „	26	1.5	10.0
<i>Milch Cattle—</i>			
Yielding 10 lb. milk	22-27	1.1-3	7.8-8.3
Yielding 20 lb. „	25-29	1.6-1.9	9.8-11.2
Yielding 30 lb. „	27-33	2.2-2.5	11.8-13.9
Yielding 40 lb. „	27-34	2.8-3.2	13.9-16.6
<i>Fattening Lambs—</i>			
65 lb. live weight	31	3.5	17
110 lb. „ „	28	2.5	15
Full grown	24-32	1.6	14.5
<i>Fattening Pigs—</i>			
44 lb. live weight	44	6.2	33.8
110 lb. „ „	36	4.5	32.0
200 lb. „ „	28	3.0	24.5

In this table all rations are calculated as required per day and per 1,000 lb. live weight. From the table we see that a horse heavily worked requires double the amount of proteins than a horse with light work. When fattening cattle or pigs, the amount of protein in the ration is reduced as the animals increase in weight. The quantities of digestible nutrients necessary for the calculation of rations may all be taken from Table II.

In order to make comparison easier the last two columns of Table II. give the **starch** and **protein equivalents** of each fodder expressed as the quantity of food in lb. required to be fed daily to a cow from 750 to 900 lb. live weight yielding about 25 lb. of milk and requiring about 26 lb. dry material, containing 1.9 lb. protein and 11 lb. starch value. Nearly the same amounts of food would be required by a horse fairly heavily worked. In all cases where the amounts of starch and protein equivalents are about the same, we know that the fodder is a well-balanced ration. We find that 16 lb. of wheat would supply the necessary amount of protein and starch, but the total weight of dry matter, of which a cow requires about 26 lb., would not be sufficient.

Of Couch grass and Prairie grass, some of the most ideal feeds for dairy cattle, about $\frac{3}{4}$ cwt. are required to supply the necessary protein and starch.

If we look at lucerne hay we find that about 24 lb. are required to supply the necessary amount of energy, but that only 17 lb. are required to supply the necessary protein, because lucerne hay has a nutritive ratio of 1 to 3.3, which indicates that it contains too much nitrogenous nutrient material as compared to carbohydrates, whereas a cow requires a ratio of about 1 part of digestible proteids to 5.4 parts of digestible carbohydrates, including fat.

When feeding, therefore, cows entirely on lucerne hay, we supply more nitrogenous material than necessary, which consequently goes to waste. It is therefore an advantage to feed a small quantity of lucerne hay and supplement the feed with fodders containing a comparatively higher amount of carbohydrates and fats, or of a wider nutritive ratio, like wheat straw, bush hay, potatoes, &c.

When using fodders like prickly-pear leaves, rather poor in nitrogenous nutrients, the fodder must be supplemented with concentrated foods rich in nitrogenous constituents like cotton-seed meal, linseed meal, or oilcake.

A cow could consume, say, 60 lb. of prepared prickly-pear leaves per day and gets therefore $\frac{6}{10}$ of .3, or about .2 lb., of digestible protein and $\frac{6}{10}$ of 6, or 3.6 lb., of starch. To supplement the ration we give in addition 25 lb. bush hay, and supply therefore $\frac{1}{4}$ of 3.2, or .8 lb., protein, and $\frac{1}{4}$ of 56.6, or 14.2 lb., starch. The cow will get a total of 1 lb. of protein and 17.8 of starch, or only about half the amount of nitrogen required. In order, therefore, to make a complete ration we must add $2\frac{1}{2}$ lb. cotton-seed meal, or 3 lb. linseed meal, or 6 lb. of oilcake to supply the deficiency of .9 lb. of protein.

Any other ration can be calculated in a similar manner.

Table II.

COMPOSITION OF FODDERS.

Giving pounds of food materials, and of digestible nutrients contained in every 100 lb. of fodder.
Pounds of each fodder required to supply a cow of 750 lb. to 900 live weight, yielding 25 lb. milk daily, with 11 lb. starch value, and 1.9 lb. protein.

	Water.	Crude Protein.	Carbohydrates.	Crude Fibre.	Crude Fat.	Crude Ash.	DIGESTIBLE NUTRIENTS.					LBS. OF FODDER TO GIVE.		
							True Protein.	Carbohydrates.	Fibre.	Fat.	Nutritive Ratio (1 ÷)	Starch Value.	Starch Equiva- lent to 11 lb.	Protein Equiva- lent to 1.9 lb. Protein.
Green Fodders—														
Grasses and Cereals—														
Barley ..	79.0	2.7	8.0	7.9	.6	1.8	1.4	5.7	4.8	.4	8.1	12.8	86	136
Buffalo grass ..	78.0	2.1	12.3	4.6	.5	2.5	1.2	9.0	2.9	.4	10.7	13.9	79	158
Couch grass ..	74.1	4.1	10.0	8.4	.4	3.0	2.4	7.3	5.3	.3	5.5	15.5	71	79
Grass, mixed pasture ..	62.1	2.4	14.8	15.6	.6	4.5	1.3	10.8	9.8	.45	16.7	22.9	48	146
Maize ..	70.9	2.6	13.4	9.6	.5	3.0	1.2	9.8	6.4	.4	14.3	18.2	60	158
Indian cane ..	77.0	1.5	11.0	8.9	.2	1.4	1.7	7.9	6.0	.2	20.5	15.0	73	272
Oats (in green head) ..	79.0	1.8	11.9	5.1	.5	1.7	1.0	7.5	3.6	.4	12.0	12.9	85	190
Paspalum ..	74.7	2.3	9.9	10.2	.5	2.4	1.3	7.2	6.4	.4	11.3	15.7	70	146
Prairie grass ..	76.8	4.3	8.3	7.2	.8	2.6	2.1	6.1	4.5	.6	5.7	13.9	90	190
Rhodes grass ..	70.3	2.2	11.8	12.2	.5	3.0	1.0	8.6	7.7	.4	17.2	18.1	61	238
Sorghum ..	70.6	2.1	15.1	9.1	.6	2.5	.8	11.3	5.4	.5	22.3	18.6	59	317
Summer grass ..	72.0	1.4	13.1	10.0	.3	3.2	.6	9.6	6.3	.2	27.2	16.9	65	173
Sugar-cane tops ..	72.7	2.4	12.3	10.0	.8	1.8	1.1	8.9	6.7	.6	15.4	18.0	61	
Legumes—														
Cowpea vines ..	79.1	3.3	8.3	5.5	.9	2.9	1.9	6.2	2.9	.5	5.4	12.0	92	100
Lucerne ..	76.0	5.4	8.3	6.8	.7	2.8	3.0	6.1	3.4	.3	3.4	12.9	85	63
Various—														
Prickly-pear (leaves) ..	89.7	.5	7.0	1.1	.1	1.6	.3	4.8	.7	.1	19.8	6.0	183	634
Saltbush ..	67.8	5.0	14.8	6.6	.7	5.1	2.6	10.1	4.1	.5	5.9	17.7	62	73
Sheeps Burnett ..	76.3	4.4	9.0	6.2	.7	3.4	2.5	6.1	3.8	.5	4.8	13.1	84	83
Sweet potato vine ..	85.6	2.0	6.3	2.8	.7	2.6	1.3	4.3	1.7	.5	5.5	.8.3	133	146
Silage—														
Maize ..	69.1	1.9	11.6	9.2	.5	2.7	1.0	7.8	6.5	.4	15.2	16.1	68	190
Sorghum ..	74.3	1.8	14.4	8.9	.4	2.2	.9	9.6	6.3	.3	18.4	17.4	53	211
Wheat, thistles and mustard ..	65.0	4.6	13.5	11.9	1.2	3.8	1.9	9.0	8.4	.9	10.2	21.2	52	100

Roots, Tubers &c.—	77.0	2.1	17.0	1.8	.1	2.0	.5	16.8	1.6	.1	37.2	19.1	58	380
Beets ..	90.5	2.4	3.8	1.5	.4	1.4	1.2	3.4	1.4	.4	4.8	6.8	162	158
Cabbages ..	87.5	1.6	7.1	1.4	.1	2.3	.6	6.5	.7	.1	12.4	8.0	138	317
Mangolds ..	75.5	2.1	20.2	.7	.2	1.3	.8	19.8	.4	.2	25.8	21.4	51	238
Potatoes ..	71.1	1.5	24.7	1.3	.4	1.0	.6	24.2	.7	.3	42.6	26.1	42	317
Ditto, sweet	83.9	2.2	8.3	3.1	.9	1.6	1.1	7.0	2.6	.7	10.2	12.2	90	173
Pumpkins ..	86.0	2.0	9.4	1.3	.1	1.2	.4	8.9	1.2	.1	25.8	10.7	103	475
Swedes ..	89.5	2.7	5.2	1.4	.1	1.1	.6	4.9	1.3	.1	10.7	7.0	157	317
Turnips ..														
Dry Fodders—														
Hay and Straw—														
Barley ..	9.5	10.4	37.2	31.8	2.2	8.9	4.5	23.8	19.1	1.2	10.1	49.7	22	42
Bush hay, good	7.5	6.1	38.6	39.8	1.9	6.1	3.2	26.2	25.0	1.1	16.8	56.6	19	59
Ditto, poor	6.5	2.8	36.6	45.3	1.1	7.3	1.3	23.4	27.2	.6	40.0	53.2	21	146
Canary grass ..	9.0	15.2	40.2	26.0	2.1	7.5	6.1	25.7	15.6	1.1	7.2	49.3	22	31
Cowpea chaff ..	8.1	15.7	31.5	26.6	4.3	13.8	8.1	22.3	11.2	2.2	4.8	45.8	24	23
Lucerne ..	8.2	21.0	31.4	25.9	2.8	10.7	11.1	21.7	11.9	1.4	3.3	46.7	24	17
Prairie grass ..	9.0	16.9	32.6	28.2	3.0	10.3	6.9	20.8	16.9	1.7	6.0	47.8	23	28
Straw, barley ..	8.5	2.9	40.2	41.0	.8	6.6	.6	21.7	22.5	.3	74.8	45.4	24	317
Straw, Oats ..	9.2	4.0	42.4	37.0	2.3	5.1	1.0	22.5	21.4	.9	46.0	46.9	23	190
Ditto, Wheat	7.6	2.5	42.2	39.3	.9	7.5	.5	16.4	21.6	.3	77.3	39.1	28	380
Wheat hay ..	8.3	10.7	33.6	37.6	2.0	7.8	4.2	21.5	22.6	1.1	11.1	50.4	22	45
Grains, Seeds, &c.—														
Barley ..	10.9	12.4	69.8	2.7	1.8	2.4	8.7	64.2	.7	1.2	7.8	75.5	15	22
Corn (maize) ..	12.0	13.1	65.8	2.0	5.5	1.6	10.0	61.2	1.2	4.7	7.3	82.2	13	19
Cowpeas ..	14.8	20.8	55.7	4.1	1.4	3.2	17.3	52.0	1.1	.8	3.2	70.5	16	11
Kafir corn ..	9.3	9.9	74.9	1.4	3.0	1.5	7.5	69.6	.8	2.6	10.1	83.1	13	25
Linseed ..	9.2	22.6	23.1	7.1	33.7	4.3	17.0	12.7	4.3	2.0	4.9	99.0	11	11
Oats ..	11.0	11.8	59.7	9.5	5.0	3.0	9.2	46.0	2.5	4.1	6.3	66.2	17	21
Rice ..	12.4	7.4	79.2	.2	.4	.4	4.6	73.1	.1	.4	16.1	78.3	14	41
Sunflower seeds ..	8.6	16.3	21.4	29.9	21.2	2.6	14.3	16.5	17.0	18.7	5.3	89.4	12	13
Wheat, plump ..	11.1	14.8	67.4	3.2	2.2	1.3	11.8	54.0	1.1	1.5	5.0	69.2	16	16
Ditto, shrunk	8.3	17.1	65.8	3.5	3.0	2.3	13.7	52.6	1.2	2.0	4.3	70.7	16	14
By-Products—														
Barley and malt combings ..	15.1	11.2	64.0	5.3	.5	3.9	8.3	44.3	1.8	.5	5.6	54.7	20	23
Bran ..	11.9	15.4	53.9	9.0	4.0	5.8	11.0	34.5	1.6	1.8	3.6	50.1	22	17
Brewers' grain, wet ..	75.7	5.4	12.5	3.8	1.6	1.0	3.9	7.7	1.5	1.4	3.2	15.9	69	49
Corn cobs ..	8.4	2.5	54.7	32.0	.7	1.7	.5	26.3	18.3	.6	92.0	46.4	24	380
Cotton seed meal ..	9.9	47.3	22.5	3.2	12.2	4.9	39.0	13.5	1.8	11.3	1.0	76.4	14	5
Linseed meal ..	10.0	36.1	22.5	8.4	3.6	5.2	30.0	28.2	4.8	3.2	1.4	67.4	16	6
Oilcake, sunlight ..	9.5	19.2	47.4	7.0	11.2	5.7	15.6	38.6	4.0	10.4	4.3	80.6	14	12
Peanut meal ..	10.7	47.6	23.7	5.1	8.0	4.9	33.8	11.6	.6	7.2	.9	59.2	19	16
Pollard..	10.0	17.4	58.0	5.2	5.6	3.8	13.9	47.0	1.7	4.8	4.3	72.2	15	14
Various Foods—														
Milk ..	87.2	3.6	4.8	..	3.7	.7	3.4	4.7	..	3.7	3.9	16.3	68	56
Ditto, skimmed	90.4	3.8	5.0	..	.1	.7	3.6	5.2	..	.1	1.5	8.7	126	53
Dried blood ..	8.5	84.4	..	..	2.5	4.6	52.4	..	..	2.5	.1	52.9	21	36
Molasses ..	24.0	2.2	63.8	..	..	10.0	..	57.5	..	..	..	58.5	19	..

DEPARTMENT OF AGRICULTURE AND STOCK.

CORN-GROWING COMPETITION, 1915-16.

1. This competition will be open to all under the age of eighteen years who are residents of the State of Queensland. An entrance fee of 2s. 6d. must be forwarded to the Under Secretary with the application to enter.

2. Applications to be enrolled in the competition, containing the following particulars, must reach the Under Secretary, Department of Agriculture and Stock, Brisbane, not later than 12 noon on the 30th September, 1915:—

- (a) Full name and address. (Give Christian names in full.)
- (b) Date of birth. (Day, month, and year.)
- (c) No. of Division in which applicant resides, and the name of the Dairy Inspector who supervises the locality.

3. The area to be devoted to the planting of the seed maize shall be one-tenth of an acre, selected seed for which will be supplied free of cost; but one parcel only will be supplied to each competitor during the period of the competition.

4. Each competitor shall have absolute freedom in his choice of ground, and in the methods he may adopt in preparing, planting, and cultivating his plot; but in no case shall a plot exceed one-tenth of an acre, otherwise disqualification will be incurred.

The following table shows the length the rows must be to give the exact area according as four, five, six, or more rows are planted:—

No. of Rows 4 feet apart.	Length of Rows in Feet.	No. of Rows 4 ft. apart.	Length of Rows in Feet.
4	272 ft. 3 ins.	8	136 ft. 1½ ins.
5	217 ft. 10 ins.	12	90 ft. 9 ins.
6	181 ft. 6 ins.	16	68 ft.
7	155 ft. 7 ins.		

5. Each competitor will be required to keep a record chart showing the dates and particulars of the different stages of work, and these charts are to be delivered, at the time of harvesting, to the officer appointed for superintending and verifying the yield.

6. Within seven days from the verification of the yield from the crop, each competitor shall select, without aid from other persons, twelve cobs of the maize from his crop, and forward them to the Department of Agriculture and Stock, Brisbane. Labels for this purpose will be supplied.

7. Competitors must notify the Dairy Inspector for the district of the date when the crop shall have matured and be ready for inspection.

8. No competitor shall be allowed to employ or permit any labour upon the competition plot standing in his name, other than his own personal labour, excepting in relation to the driving of horses, for which, owing to circumstances, such help may be needed.

9. The competition will close on the 30th June, 1916, and the prizes will be allotted thus:—

The competitors will be grouped according to the following divisions:—

(1) The district supervised by—

Mr. S. A. Clayton, Dairy Inspector, Beenleigh.

Mr. H. C. Gordon, Dairy Inspector, Harrisville.

Mr. D. J. Binnie, Dairy Inspector, Rosewood.

(2) The district supervised by—

Mr. C. C. Pickering, Dairy Inspector, care of Mr. D. Macpherson, Montague road, South Brisbane.

Mr. R. G. Ridgway, Dairy Inspector, Ellerslie Crescent, Taringa, Brisbane.

Mr. R. Winks, Dairy Inspector, Gympie.

Mr. F. J. Watson, Dairy Inspector, Bundaberg.

Mr. W. S. Harding, Dairy Inspector, Esk.

(3) The district supervised by—

Mr. J. H. Barber, Dairy Inspector, Crow's Nest.

Mr. J. P. Carey, Dairy Inspector, Gatton.

(4) The district supervised by Mr. W. Hartley, Dairy Inspector, Nanango.

(5) The district supervised by—

Mr. J. J. Carew, Dairy Inspector, Russell street, Toowoomba.

Mr. L. Verney, Dairy Inspector, Newtown, Toowoomba.

Mr. J. R. D. Munro, Dairy Inspector, Warwick.

(6) The district supervised by Mr. C. Queale, Dairy Inspector, Gayndah.

(7) The district supervised by—

Mr. J. Cattanaach, Dairy Inspector, Dalby.

Mr. R. S. Sigley, Dairy Inspector, Roma.

Mr. W. R. Holmes, Dairy Inspector, Goondiwindi.

(8) The Central district of Queensland, including that supervised by Mr. H. T. Deighton, Dairy Inspector, Rockhampton.

(9) The Northern district of Queensland, including that supervised by—

Mr. E. C. Lake, Dairy Inspector, Mackay.

Mr. H. C. Colledge, Dairy Inspector, Atherton.

If there are more than ten competitors in any division, three prizes will be awarded for competition in that division; less than ten competitors, one prize only.

The prizes shall be of the following value:—First, £5; second, £2; third, £1.

No money prizes will be given, but each successful competitor will be allowed to select some article to the value of his prize.

The prizes awarded in any division may be increased in number and value by donations from persons, firms, or societies who may be interested in the competition.

10. Three special prizes of the value of £10, £5, and £3 will be awarded to the competitors who stand first, second, and third in the entire competition.

These prizes may be increased in number and value in the same way as indicated above in connection with the divisional competitions.

No prize will be awarded unless the yield of corn equals 20 bushels per acre. This stipulation may be waived under very exceptional circumstances in the case of a lower yield.

11. The aggregate points will be 100, and the judging will be based upon the following:—

(a) Quality of the maize produced.

(b) Yield of plot.

(c) Notes and records of plot.

12. The Director of Agriculture will be the sole judge of the competition, and his decision shall be final.

WILLIAM LENNON,

Secretary for Agriculture and Stock.

Brisbane, 30th July, 1915.

EXHIBITION NOTES, 1915.

DISTRICT EXHIBITS.

The Council of the National Association must be heartily congratulated on the gratifying results which have attended the Exhibition at Bowen Park in August, 1915, notwithstanding the great handicap of the breaking out of the European war, with its heavy calls, not only on the purses of the public throughout the State, but on some thousands of the flower of the young men of the towns and of the country districts, who in past years of peace have flocked every year to the metropolis to enjoy a week's holiday and, incidentally, to expend large sums in various ways during the national carnival. These patriotic men, as well as women, who have nobly gone to the front, will have doubtless been recalling memories of their enjoyment of the Exhibitions of previous years, whilst patriotically and cheerfully undergoing the dangers and privations to which they, to their eternal honour, have subjected themselves.

The severe drought conditions which prevailed for months prior to the Show date also contributed to the difficulties so ably overcome by the Association.

The value of the work of the Association consists not merely in the amount of money taken at the gates and otherwise, but in its effects in bringing together people from all parts of the Commonwealth, as well as many from overseas, thus advertising far and wide the great resources of this most resourceful of all the States of Australasia. The general public is naturally unaware of the great volume of business transacted during and after the Show, as a direct consequence of the advantages offered to business men, and to buyers and sellers generally, by personal inspection of the exhibits and personal communication with agents. Thus, as an advertising medium, irrespective of its value from an educational point of view, the National Association's Exhibition is of primary importance, and fulfils a purpose which it would be impossible to attain in any other way. Space will not admit of our giving a comprehensive description of the multifarious exhibits in this Journal. This we leave to the enterprise of the metropolitan and country journals, confining ourselves to special salient points in connection with them.

During the past year the Association had to deplore the demise of the late Secretary, Mr. Arvier, to whose energy and enthusiasm was due the success attending many previous Shows. His successor, Mr. J. Bain, has already given evidence of good organising ability, and his energy will doubtless be instrumental in building further success on the solid foundation laid by his predecessor. The position of Secretary to an important Association such as this one demands much tact and firmness, at Show time especially, when one has to remember the quotation

so very appropriate to the occasion—“*Tot homines, quot sententiæ*,” which, being interpreted, implies that where there are many gathered together, there will be as many different opinions.

In connection with the exhibits, those coming under the head of “District Exhibits” deserve special mention. Of late years they have formed a very distinctive feature of the annual Exhibition, and are especially valuable in educating the people in respect of the various products and industries of Northern, Southern, Central, and Western Queensland, of the tablelands and plains and coastal areas, which embrace tropical, sub-tropical, and temperate districts of a State covering an area of nearly 700,000 square miles. It is owing to the vast distances which separate these from each other, that little would be known of the products and possibilities of particular districts, were it not for the bringing together of these districts by means of the National Association’s Exhibitions.

The very attractive District Exhibits, therefore, deserve special mention, forming, as they do, a distinctive feature of the Exhibition, as before stated. In times past, the Moreton District exhibit has been very successful in taking first place amongst these important exhibits. It was in 1906 that Moreton and Wide Bay and Burnett tied, and Moreton won the Chelmsford Shield in the following year. The latter district was also successful at the Bowen Park Shows of 1903, 1904, 1905, tying with Wide Bay and Burnett in 1906.

In 1907, Moreton decided to rest on its laurels and stand out in 1908. This was much to be deplored, although it was certainly magnanimous of the Moreton men. Still, it was considered that every district throughout the State should put forth its best endeavour to show what its resources are, and, win or lose, there will always be the satisfactory consciousness of having done something for the dissemination of a knowledge, or a dissipation of the crass ignorance existing in some quarters of the grand resources of this “Queenly State.”

In 1908, other districts determined to wrest the laurels from the men of Moreton, and they gradually crept up, and the Central District was successful in that year.

In 1909 the honours went to Wide Bay and Burnett.

In 1910 a new departure was made by the Council of the Association, no general districts, as a whole, being represented, but their place was taken by what was termed “One Farm Exhibits.” Probably more interest was taken in these than in the former classes. The object was to show what could be done by individual farmers. No district was ransacked to obtain every conceivable product, from a pincushion to a pumpkin, from a horseshoe to an engine, but everything shown was absolutely produced on the competing farms by the farmer and his family.

The result of this decision fully justified the new departure, and seven entries represented the first struggle. Under the caption “One Farm Exhibit,” we have given all the information on these, as well as



PLATE 6.—DISPLAY OF TROPICAL PRODUCTS, DEPARTMENTAL COURT (AGRICULTURE AND STOCK), NATIONAL ASSOCIATION SHOW, BRISBANE, 1915.

we know, up to the present date. It will be interesting to recall the words of the Hon. W. Kidston, then Premier of Queensland, on the subject of "District Exhibits," at the luncheon on the opening day of the Exhibition of 1906. He said, *inter alia*:—"The thing that struck him most about the annual Exhibition was its truly national character. The district exhibits were an admirable feature of the Show, and the competition was excellent from a national point of view. A personal patriotism was shown in the exhibit of articles for the sake of the district. It was an exceedingly healthy and profitable spirit to inculcate. . . . They needed to educate their own people in the possibilities of their own country, and if they could develop the district competition sufficiently, they might be able, not only to educate their own people, but to get together products from all parts of Queensland which would be worth sending to the old country. He was certain that, if the display was really worthy of the industries and production of Queensland, it would not only open the eyes of many Queenslanders, but would open the eyes of the people in the old country as to the value and possibilities of Queensland." This was putting all we have said and written in the past on the subject in a nutshell, tersely, and to the point, and verily the honourable gentleman unconsciously spoke prophetically, seeing that what he suggested as a possibility has become a reality, Queensland's products and industries having long since been exhibited in the old country, on the Continent of Europe, and now in San Francisco.

This year the Northern Rivers of New South Wales, the Western districts, and the Thera district of the same State were grouped under the title of

THE "A" GRADE.

WESTERN DISTRICTS (N.S.W.).

Last year the Western districts competed in this section, and the extent of the exhibits may be accounted for by the fact that the district comprises such centres as Bathurst, Dubbo, Mudgee, Orange, Lithgow, Wellington, and Blaney. The exhibits comprise 100 fleeces of wool both of the pure merino and its crossbreeds. As might be expected, wheat figures largely, as do hay and chaff, maize, grasses, tobacco, whilst it would seem impossible to present more magnificent apples, pears, peaches, and oranges than those grown at Dubbo. Marble from the Bathurst quarries (much used throughout the Commonwealth) attracted considerable attention. Dairy products were also in evidence, especially Cheddar cheese made at the Byalong Cheese Factory.

NORTHERN RIVERS (N.S.W.).

The Northern Rivers of New South Wales and their products are better known to Queenslanders than the Western districts of that State, owing to their proximity to the Southern districts of Queensland, and to the fact that it has long been acknowledged that Brisbane is the natural outlet for the products of those fertile districts and that only the construction of a short line of railway is needed to connect them with the Southern Queensland railway system. Most of the exhibits came from

the Tweed, Richmond, and Clarence Rivers, and the display was arranged by the North Coast Agricultural Shows' Association. Byron Bay and Ramornie were well to the front with dairy produce, swine products, and canned meats. Farm products, honey, jams, pickles, &c., were all largely represented and excellent of their kind. Sugar-cane, being grown to some considerable extent on the Tweed River, was well to the fore, and citrus and many tropical fruits were largely in evidence, proving that the climate and soil of the Rivers are much akin to those of Southern Queensland.

SOUTH COAST, QUEENSLAND.

It was gratifying, of course, to Queenslanders that the South Coast exhibit succeeded in carrying off the first prize in the "A" Grade. Six years have elapsed since the district, under the name of the Logan, appeared as a competitor at the Bowen Park Show. To-day the South Coast includes in its extensive area some of the finest agricultural, dairying, and fruit-growing soils in the State, nearly all of which had large areas under sugar-cane in the old days of sugar-growing in the State. These are Cleveland, Redland Bay, Ormiston, Beenleigh, Coomera, Nerang, Pimpama (Ormeau), and Yatala. Other non-sugar districts were Manly, Springbrook, Tabragalba, Beaudesert, &c. The exhibits comprised many varieties of sugar-cane, sugar raw and refined, cereals, potatoes, root crops, hay, grasses, fruits, and a vast variety of timber, besides multifarious products of the farm, women's industries, &c. Dairy products, hams, bacon, &c., were well to the fore. The exhibits were displayed to the greatest advantage.

"B" GRADE.

GYMPIE.

The Gympie exhibit was an "eye-opener" to many whose only idea of Gympie has hitherto been that the district is only devoted to gold-mining. Included therein is part of the celebrated Blackall Range, now so well-known for its magnificent scrub soils, hundreds of acres of which have long since been producing fortune-making crops of citrus fruits, pineapples, bananas, &c., beside ordinary farm and dairy products, Yandina, the Maroochy, Cooroy, &c., all districts producing splendid timbers, fruits, farm and dairy produce, &c., besides sugar-cane and sugar, of all of which there were splendid samples, especially of the magnificent kauri pine of Kin Kin, Lake Cootharaba. Gold specimens there were, of course, but the products of the soil were pre-eminent. Of the prize money allotted to "B" Grade exhibitors Gympie took the largest share.

MURGON, WONDAL, AND TINGOORA.

combined to make a very excellent display of the products of the Southern Burnett District. The above three districts are on the Maryborough-Nanango line. The exhibits, tastefully arranged, comprised a great variety of farm products, such as maize, potatoes, hay and chaff of various kinds, broom millet, sugar-cane, natural and artificial grasses. From the Murgon factory came the butter, from Goomeri the cheese,

from Wondai a fine sample of joinery work. The fruit section was well represented by citrus fruits, bananas, apples, &c. This was quite a typical display of the agricultural products of the Burnett. There was a wonderful exhibit of the industry of the ladies in the shape of those comestibles of which our ancestral mothers were so proud—namely, jams, jellies, preserved fruits, pickles, cakes, and confectionery. It was stated that some 400 varieties were tabled. Then there was a quantity of various kinds of needlework, embroidery, and other delicate confections, which added greatly to the attractions of the exhibit.

LOCKYER.

The Lockyer is essentially an agricultural district, and its varied products have always been conspicuous at our annual Exhibition at Bowen Park. How the varied excellent specimens of field produce shown have been produced in the face of the exceptionally dry season is not easily explainable, but there they were, and as fine as if there had been a plentiful rainfall, or grown under irrigation. The Laidley and Gatton districts have long been famous for their heavy lucerne and potato crops, and both grasses and potatoes, as well as sweet potatoes and maize, were in perfect condition. Vegetables, especially cabbages and cauliflowers, were in profusion, and a useful exhibit was that of varieties of farm seeds. Honey appears to be a specialty of the district, and the exhibitors were in hopes of repeating their success in obtaining a special prize for this product as in 1914. The numerous butter and bacon factories in the district were well represented by their butter, cheese, hams, and bacon. Farm-made butter of excellence was also to be found in this section. There were three exhibits of what may be called neglected industries of Queensland, although all grow to perfection in the district, and would produce heavy crops. These were sisal hemp, tan barks, and cotton, and fabrics from sisal and cotton fibre were shown. Neither is silk wanting, and this is another neglected industry which does not appeal to the Queensland farmer or his family. Stone from the Helidon quarries, ready dressed for the builder, and soft woolly fleeces represented two important industries. And then came the samples of woman's deft work, in the shape of comestibles and needlework, destined to vie with the same subjects in all the other district exhibits. The Lockyer was a display worth visiting.

KINGAROO.

This exhibit, which was organised by the Agricultural, Pastoral, and Industrial Society, properly represented the resources of the South Burnett, in the same direction as did Wondai, seeing that the two districts are conterminous. Amongst the agricultural exhibits were to be seen very fine onions of several distinct varieties, including tree and pickling onions, leeks, and eschalots. There was a very fine wool trophy, and an exhibit of hides and tanned pelts. A very useful lesson was afforded by a plot set out with various grasses and samples of the soils of the district. This is of more importance than most people are aware of, seeing that frequently, when an intending selector wishes to settle in any particular district, his first inquiry is as to the nature of

the soil; and the exhibition of the soils and subsoils of the locality might often decide the inquirer as to whether such or such country would be suitable for him.

CROW'S NEST.

Crow's Nest is a very fertile district only 34 miles from Toowoomba, and is very strong in the production of cereals, potatoes, pumpkins, chaff, grasses, vegetables, timbers. The samples of these were certainly very commendable, especially those of all the best-known and most profitable varieties of maize. The same may be said of the wheat exhibits, comprising Gluyas, Bunge, and others raised from seed from the wheat experiment State Farm, Bungeworgorai, Roma. It was at Geham, on the Crow's Nest branch railway line (15 miles from Crow's Nest), that the corn grown by H. W. Abel won a £2 prize, also a special prize of £3, and N. S. Smooty, of Pinelands, Crow's Nest, won the district prize of £5, as well as a special prize of £5, in the corn-growing competition of 1914-15, held by the Department of Agriculture and Stock, when there were sixty-two entries by Darling Downs lads. His good work yielded at the rate of 82 bushels per acre, and F. Franke, of Cawdor, on the same line, raised 76 bushels per acre, also being a prize-taker. These examples go far to show the adaptability of the Crow's Nest soil and climate for maize-growing. It should be stated that the abovenamed young farmers were aged, respectively, fourteen and fifteen years.

Lucerne, Rhodes grass, and panicum appear to thrive well in the district, and the mangolds could scarcely be beaten anywhere for size and weight of crop per acre. The timbers were shown in the rough, and in the polished and unpolished state. The dairying industry, as elsewhere on the Darling Downs, was well represented, and the exhibits were interspersed with the many varieties of preserves, and other useful and delicate articles, the work of the ladies of the households.

Mr. John Macdonald (chairman of the National Association Council) presided at the annual informal meeting of those connected with the district and one-farm displays. Messrs. John Reid, A. W. Cameron (council stewards), and J. Bain (secretary) were also present, and there was a good attendance of the workers in connection with the different exhibits.

The chairman said he was glad to once again meet the district exhibitors. The National Association duly appreciated the work done in that section of the annual Exhibition, and in every way possible endeavoured to encourage them to come each year, for the council recognised that such displays were an object lesson as to the fertility of the soil and the high quality of the primary products of the State. The work of arranging these displays, he thought, was of considerable magnitude, but he was pleased to see that progress was being shown all round. Never had there been retrogression during the twenty years the district exhibits had been displayed in the Exhibition. He thanked all for their very hard work. During the previous year the Association spent no less a sum than £2,000 on these district displays, so that the

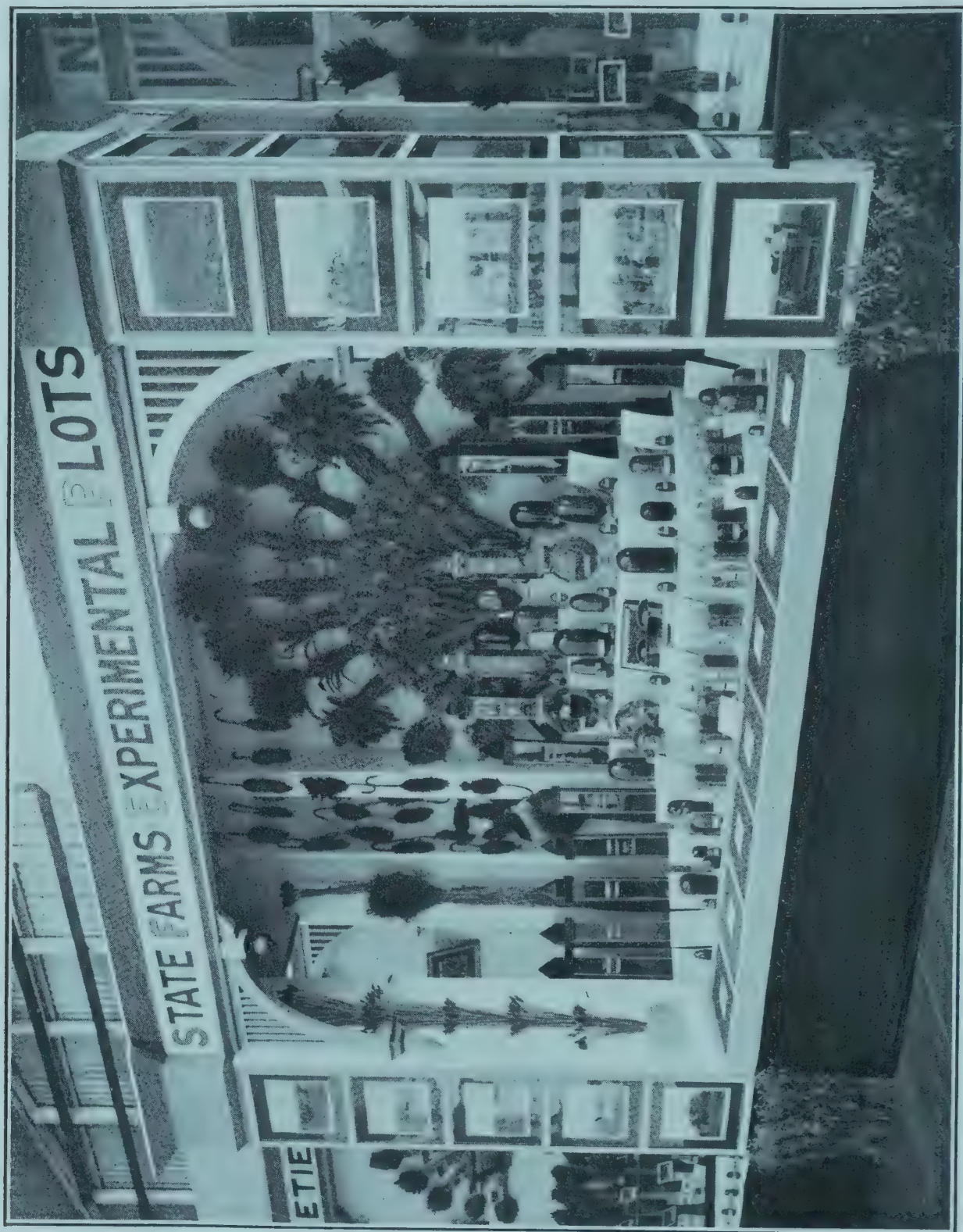


PLATE 7.—DEPARTMENTAL COURT (AGRICULTURE AND STOCK), CENTRAL DISPLAY FROM STATE FARMS AND EXPERIMENTAL PLOTS, NATIONAL ASSOCIATION SHOW, BRISBANE, 1915

public understand that the Council was thoroughly alive to the fine advertisement Queensland secured through these collections of exhibits. Considering every aspect of the case, it was decided this year to give each of the "A" Grade districts a bonus of £20, and to increase the prize money in the "B" Grade by £50. The altered prize money was as follows:—"A" Grade: South Coast, £130; Western Districts, N.S.W., £105; Northern Rivers, N.S.W., £75. "B" Grade: Gympie, £73 18s.; Lockyer, £73; Kingaroy, £69 1s.; Wondai, Murgon, and Tingoora, £68; Crow's Nest, £66 1s. One-farm displays: O. C. Williams, £54 8s. 9d.; T. Nystrom, £45 11s. 3d. He sympathised with Mr. Trevitt, manager of the Western districts, in having met with an accident.

Mr. John Reid said the district exhibits had greatly improved during the last few years, and now they had been brought to the highest plane. He trusted that next year more "A" Grade districts would compete. The whole display had been astonishing, not only to the council but also to the public who visited the show.

Mr. A. W. Cameron said that arranging district displays had now become a science. Many small details required their consideration. They always endeavoured to secure the very best judges available for the work, but if there had been any errors of judgment it was no fault of the association. He trusted that all present would help at the next Exhibition, and encourage other districts to enter into the competition.

DEPARTMENT OF AGRICULTURE AND STOCK.

As in former years, that portion of the Exhibition building devoted to the exhibits of the Department of Agriculture was nicely arranged, and set forth to the best advantage the multifarious products of the State, which include those of the torrid, sub-tropical, and temperate zones. Even a cursory inspection of the exhibits of the different branches of the Department must convince the stranger that Queensland is a most desirable State to select for a home. In this section, as also in the District sections, may be seen practical proofs of the extraordinary resources of the country, as well in climate, rainfall, and soil, as in the vast areas of land open to selectors. All the trophies and displays here have been arranged, not only with a view to spectacular effect, but rather with the idea of making everything in the section serve an educational and instructive purpose. The different sections and trophies, illustrating the Department's activities, were, as described in the "Brisbane Courier":—

Sheep and wool, stock experiment station, botanical division (weeds and suspected poisonous plants, and native grasses), division of entomology and vegetable pathology, pure seeds display from the seed-testing branch, combined seed-corn and corn-growing display, exhibit of saccharine and non-saccharine drought-resistant sorghums, broom millet (educational display), tropical products, tobacco (pipe, cigar, cigarette), fibres (including cotton), hay, chaffs, and fodders, vegetables (including special display of imported potatoes, grown at the Agricultural College,



PLATE 8.—EXHIBIT OF SACCHARINE AND NON-SACCHARINE SORGHUMS (DEPARTMENTAL COURT, AGRICULTURE AND STOCK) NATIONAL ASSOCIATION SHOW, BRISBANE, 1915.

Gatton), Roma State Farm wheat and wheat-breeding display, various products from the Agricultural College, wheat, maize, sorghums, and fodders from field experiment plots, cereals and fodders from Warren and Hermitage State Farms, trophy of typical Queensland fruits (temperate and sub-tropical), Gordo Blanco raisins from Roma State Farm, farm and garden seeds, samples of seed wheat distributed to farmers under the 1915 wheat extension scheme, and photographs illustrating the State's primary industries.

The seed-testing branch exhibit includes a collection of seeds, comprising not only such well-known kinds as lucerne, prairie, oats, &c., but the samples as often sold to the seed trade, and the same after cleaning and grading preparatory to resale. All buyers of agricultural seeds are not as yet fully aware of the working of the Pure Seeds Act, and the seed-testing branch has been established so that they may guard against sowing seeds of low quality. Any purchaser may send samples to the branch to be tested for purity and germination. If a buyer insists on a low price he is practically insisting on low quality. One sample of Algerian seed oats, the sale of which was stopped by the Department, contained 46.48 per cent. of impurities (14.16 Star Thistle, 12.06 barley, 18.33 darnel or drake, 1.93 other impurities.) The cleanings from lucerne and prairie grass are object lessons as to the value of recleaned and graded samples. The samples of weed seeds—the dodder, darnel, star thistle, wild radish, and several others—were taken from the bulks of seed offered for sale. The system of testing adopted by the seed branch, after very careful investigation of the methods used in London, Paris, Copenhagen, Zurich, and Wageningen, may be briefly described as follows:—Purity tests: In testing for purity only foreign seeds, and foreign matter such as sand, stalks, &c., are treated as impurities. Germination tests: All seeds of the species to which the sample purports to belong are included without reference to their condition of maturity (immature seeds and seeds without kernel are retained as pure seeds). Check tests are made of every sample. The “Tissot” method, by germinating the seeds on damp flannel, and by the “Simplicitas method,” germinating the seeds in sand, on porous blocks; both of these systems are demonstrated in the exhibit.

Soil Exhibit.—Soils from some of the most important and characteristic farming districts of the State were collected, the soil being taken to a depth of 2 ft., and are exhibited in specially made glass columns. The soils represent some of our fertile lands, many of which have been under cultivation for a great number of years. There are sugar-cane soils from Mulgrave, Mackay, and Bundaberg; wheat soils from Miles, Roma, and Westbrook; maize soils from Kingaroy, Beaudesert, and Tallegalla; lucerne soils from Murgon and Rosewood; potato soils from Beenleigh, Goombungee, and Lockyer. The collection also includes a soil from Buderim Mountains, well known for its excellent bananas; a soil from the Stanthorpe district, particularly suitable for stone fruit; particularly rich fertile soils from the Bowen district, suitable for citrus fruit and tobacco culture; a typical soil of good grazing

country from Westwood. A printed card gives for each soil a short description of the locality and the crops chiefly grown. The mechanical compositions with regard to the amount of sand, silt, and clay are given, followed by the chemical composition, showing how much of the important plant foods—nitrogen, potash, lime, and phosphoric acid—the soil contains in percentage, and also expressed in lb. per acre to a depth of 12 in.

Seed Corn and Corn-growing Display.—Three descriptive features are represented. Firstly, a collection of seed maize grown at the various departmental propagation plots, originating from grain imported from the United States of America. Systematic attention has been given to seed selection by field officers of the Department, and the produce from the plots is sold to farmers, who in this way have the opportunity of securing approved strains of seed. This season's orders have already absorbed all available stocks. The second feature comprises an educational exhibit, dealing in a comprehensive way with several types of maize. Typical ears of different stud varieties are shown in groups and in glass cases. Special attention has been given to the points governing seed selection in the field and barn, and concise information is furnished on descriptive cards and labels in such a way that anyone may become readily acquainted with the subject. The third section illustrates the final results of the recent corn-growing competition under eighteen years of age. Tabulated returns, prizes, and award cards are displayed in close proximity to the exhibits, which are arranged into groups representing nine different divisions of the State.

Sorghum Trophy.—The seed heads and seed of a number of saccharine and non-saccharine sorghums aggregating ten different kinds are displayed on a large trophy, to effectively present the different characteristics of each. The chief value of this exhibit lies in the fact that the non-saccharine kinds were imported from the United States, where they had established a reputation for drought-resistance. The Department has advertised seeds of respective kinds for sale, and already sufficient orders have been received to absorb all the stocks in hand. It is expected that during the coming season over 300 acres will be placed under crop from the seed so distributed.

Broom Millet Display.—The high price of well-graded and well-prepared fibre (from £37 to £40 per ton in Brisbane) indicates there is good money in this commodity. It is customary for growers to pay somewhat too limited attention to the grading, classing, and baling of the fibre for market. The different samples of fibre and articles in process of manufacture are arranged to serve as a guide for the grower when harvesting and preparing his crop for market, as so much depends on proper preparation and get-up.

Wheat.—In the general display of sheaves of wheat and grain the collection of new crossbred and named varieties of wheat from the Roma State farm are prominent. The bright attractive straws and prolific types of ear generally to be noted indicate that good progress is being made with the development of new varieties. A collection of over



PLATE 9.—A SECTION OF THE WALL DISPLAY IN THE COURT OF THE DEPARTMENT OF AGRICULTURE AND STOCK, NATIONAL ASSOCIATION SHOW, BRISBANE, 1915.

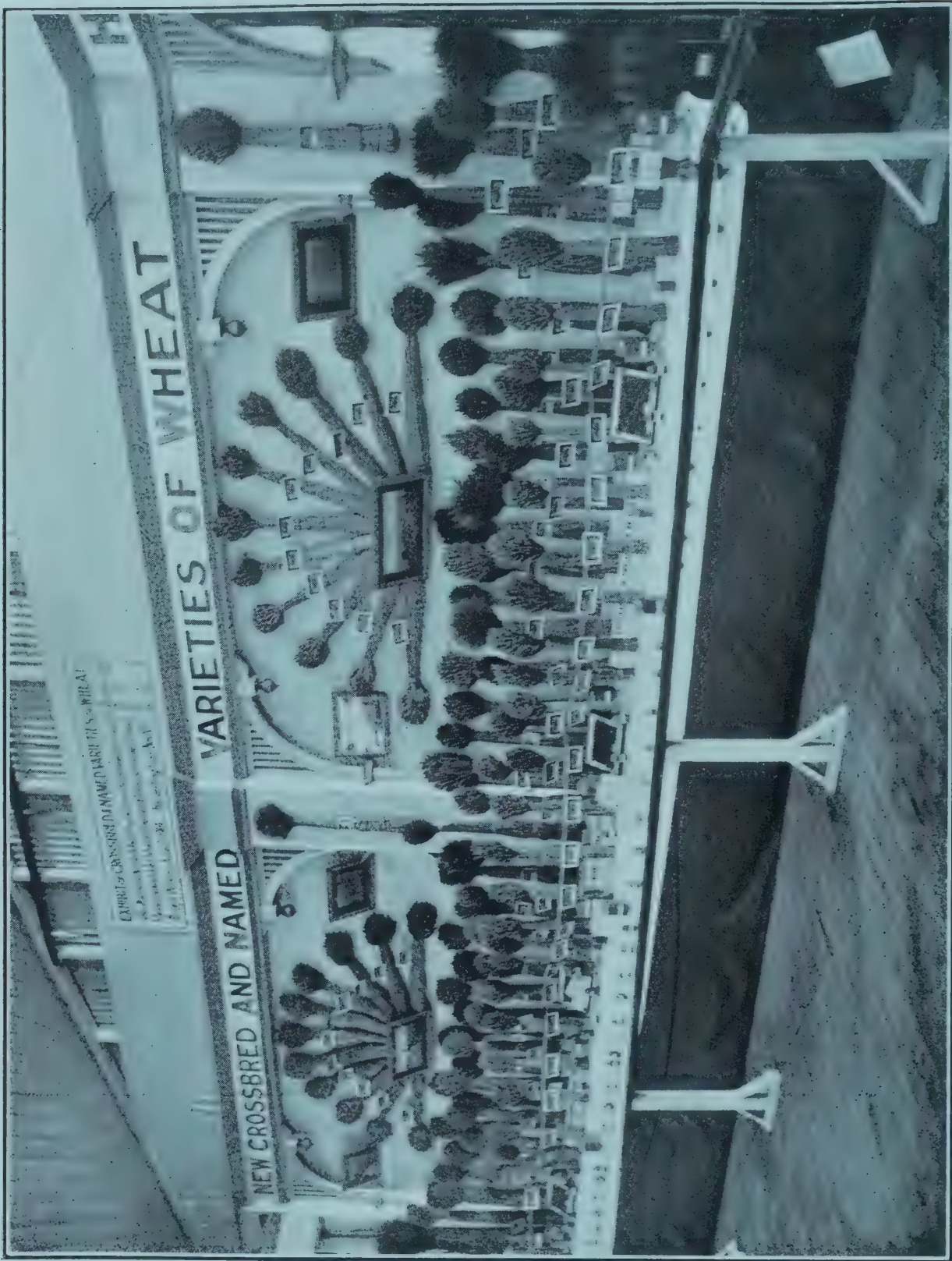


PLATE 10.—SECTION OF THE WHEAT EXHIBIT, DEPARTMENTAL COURT (AGRICULTURE AND STOCK), NATIONAL ASSOCIATION SHOW, BRISBANE, 1915.



PLATE II.—DISPLAY OF WOOLS, DEPARTMENTAL COURT (AGRICULTURE AND STOCK). NATIONAL ASSOCIATION SHOW, BRISBANE, 1915.

fifty varieties raised at one of the field experimental plots in the Goondiwindi district shows conclusively what this tract of country is capable of producing. In this lot representative Canadian, Indian, Roma, and Southern wheats predominate, and it is interesting to note that a variety known as Pusa No. 12, which is reported to have given such excellent results in India, has also shown out prominently here in relation to its field characteristics.

Wool.—The wool exhibit this year takes a different form from that of other years, and has been arranged for instructional purposes in keeping with the character of this branch of departmental work, as well as to illustrate the perfection which the State has attained in the production of a wide range of notable wools and of different sheep breeds and their crosses. The success of Queensland in this particular section at the Panama Exposition shows that this State can hold its own with any other part of the Commonwealth in the matter of growing high-class wools of all kinds, including British breeds and crossbreds. In regard to the introduction of sheep on coastal areas, the show of British breeds, while not as complete as could be wished, contains good examples of such wools as are produced by the Border Leicester and Romney Marsh breeds. These breeds, so far, have done remarkably well under coastal conditions, and farmers may see the class of wool grown by each of these. The business of growing sheep on the coast is comparatively new, and other varieties may show up just as well as those named in the future, but at present it may be said that these two—Border Leicester and Romney Marsh—do very well. The examples shown are nearly all Queensland grown. One illustrative exhibit is that of a selection of Corriedale wools bred in the Longreach district by Mr. G. C. Greenwood, of Tocal. This example shows that long wools and crossbreds may be bred successfully in the hot West as well as on the coast and the Downs. Other examples show pure Lincoln, Leicester, Border Leicester, Dorset Horn, and Romney Marsh, with their various crosses. There is also a fairly representative selection of merino fleeces of much the same quality as those which gained the gold medal at the Panama Exposition recently. A small exhibit of mohair, Queensland bred, at Miles, by Mr. E. Scammell, is worth inspection.

ONE-FARM EXHIBITS.

There were three entries in this section, the competitors being Messrs. O. C. Williams (Plainby), J. A. Nystrom, Booie, Kingaroy, and Mr. G. Trevitt (Bathurst, New South Wales). On previous occasions—1911 and 1913—the winners were, respectively, Messrs. Allen Bros. of Gympie, who secured a £200 prize (1911), and Mr. H. Franke, of Cawdor (1913).

Of the three competitors at the Exhibition of August, 1915, one had the misfortune to drop out owing to an unfortunate injury to the hand sustained by Mr. G. Trevitt, of Bathurst, New South Wales, through a fall from a ladder. On these exhibits, one of the judges, Mr. C. Siemon, said a lot of time and labour had been expended by both exhibitors, and their displays were a credit to their respective districts, and more so to their own farms. The agricultural products were a



PLATE 12.—O. C. WILLIAMS'S ONE-FARM EXHIBIT AT THE NATIONAL ASSOCIATION SHOW, BOWEN PARK, AUGUST, 1915.



PLATE 13.—EXHIBIT FROM YEERONGPILLY STOCK EXPERIMENT STATION, DEPARTMENTAL COURT (AGRICULTURE AND STOCK), NATIONAL ASSOCIATION SHOW, BRISBANE, 1915.



PLATE 14.—DEPARTMENTAL COURT (AGRICULTURE AND STOCK), ENTOMOLOGICAL AND VEGETABLE PATHOLOGICAL EXHIBITS, NATIONAL ASSOCIATION SHOW, BRISBANE, 1915.

splendid feature of each competitor's exhibit. The hays, chaffs, and grains forming part of the exhibits were very fine. Another prominent feature in each man's display was the excellent collection of preserves, jams, &c. The vegetable section in each was very poorly represented. The home work by the lady members of Mr. Williams's household was a credit to them. Mr. Williams's labour and time-saving implements used in connection with the work on his farm showed much ingenuity. Mr. J. Fenton, another of the judges, acquiesced with his colleague's remarks. Mr. Williams beat Mr. Nystrom by 57 points.

The following were the points awarded:—

	Possible.	Nystrom.	Williams.
1. Dairy Produce—			
Butter, 6 lb... ..	25	18	15
Cheese, one large or two small	20	18	19
Eggs, one dozen	5	3	4
	50	39	38
2. Foods—			
Hams, 15 lb.; bacon, 15 lb.	20	10	15
Corned, smoked, and spiced beef and mutton, 10 lb.	10	5	6
Honey, 12 lb.	10	7	7
Beeswax, 6 lb.	5	3	3
Bread, 2 loaves; scones, 1 dozen	5	3	4
Confectionery and sweets, 3 lb.	5	2	5
Lard, tallow, and oils	5	2	4
	60	32	44
3. Fruits, vegetables, and roots, fresh and preserved—			
Fresh fruit, all kinds	25	15	10
Dried fruits	10	6	4
Preserved fruits and jams	15	10	14
Fresh vegetables	15	7	10
Pickles, sauces, &c... ..	15	10	12
Potatoes (56 lb.), or a collection, and roots	25	18	15
Table pumpkins, squashes, and marrows, 56 lb.	10	6	6
Cocoanuts and nuts	3	2	2
Vegetable and garden seeds, 5 lb.	5	3	4
Arrowroot, 10 lb.	5	3	3
Cassava, 3 lb.	5	..	..
Ginger, 3 lb... ..	5	..	..
Sugar beet, 3 lb.	5	3	3
	143	83	83
4. Grain, &c.—			
Wheat	25	18	14
Maize	20	16	14
Barley	10	7	6
Oats, rye, and rice	15	10	10
	70	51	44
5. Tropical Products—			
Sugar-cane, 24 stalks or 1 stool	30	..	..
Cotton, in seed, 10 lb., long staple	10	8	1
Coffee, 10 lb.	15	..	..
	55	8	1
6. Tobacco—			
Tobacco, leaf, dried, 5 lb.	10	..	4
	10	..	4

	Possible.	Nystrom.	Williams.
7. Hay, Chaff, &c.—			
Hay, oaten, wheaten, lucerne, and other varieties	20	8	17
Grasses and their seeds, including canary	10	4	8
Chaff, oaten, wheaten, lucerne, and other varieties	20	6	15
Ensilage, any form	15	..	6
Cattle fodder (pumpkins and green fodder)	15	8	10
Sorghum and millet	10	5	6
Hemp, 5 lb.	5	..	..
Flax, 5 lb.	5	..	2
Cowpea seed, 7 lb.	7	5	2
Broom millet, 10 lb.	10	8	5
	117	44	71
8. Wool—			
Greasy, 5 fleeces	20	10	10
Mohair	5	..	2
	25	10	12
9. Drinks, &c.—			
Temperance drinks, 6 bottles	10	5	4
	10	5	4
10. Women's and Children's Work—			
Needlework, knitting, fine arts	10	3	8
School work, maps, writing, &c.	10	..	8
Fancy work	10	6	8
	30	9	24
11. Miscellaneous Articles of Commercial Value ..	5	2	4
12. Plants and Flowers, in pots	5	1	3
13. Time and Labour Saving Useful Articles, made on the farm	10	..	7
14. Effective Arrangement of Exhibits	10	6	8
	600	290	347

CORN-GROWING COMPETITION.

This interesting and, from a rural educational point of view, most highly valuable competition, which was arranged by the Department of Agriculture and Stock last year, was concluded on 30th June, 1915, and adjudicated upon in July last. For several reasons, principally climatic, the competitors were grouped according to nine districts, embracing the whole State from the border of New South Wales northwards to Cooktown, and westwards as far as Longreach, Cunnamulla, and Wallangarra, thus including every town and rural district throughout the State, the divisions being nine in number—viz., Logan, West Moreton, Darling Downs North, Darling Downs South, Maranoa, Moreton, Wide Bay and Burnett, Central Queensland, and North Queensland. Prizes of the following value were awarded:—First £5, second £2, third £1, and in addition three special prizes to the value of £10, £5, and £3 to be awarded to the competitors who stood first, second, and third in the whole competition. The conditions will be found on page 61 of the August issue of this Journal, 1915, and also on page 124 of this issue. It is notified

by the Department that a similar Corn-growing Competition to that of 1914-15 will be held for 1915-16, entries closing with the Under Secretary, Department of Agriculture and Stock, Brisbane, on the 30th September next.

DISTRICT PRIZE WINNERS.

			Points	£	Yield. Bushels per Acre.
West Moreton—					
J. R. C. Hart, Blackbutt	..	..	86.4	5	92
F. A. Bade, Rosewood	..	..	65.8	2	69
A. M. Bachmann, Marburg	..	..	60.7	1	56
Darling Downs North—					
N. S. Smoothy, Pinelands, Crow's Nest	..	..	77.1	5	83
H. W. Abel, Geham	..	..	74.9	2	82
F. Franke, Cawdor	..	..	72.2	1	76
Darling Downs South—					
Albert Gouchee, North Killarney	..	..	72.5	5	74.7
Archibald Gouchee, North Killarney	..	..	49.5	2	44.5
A. E. Ernst, Spring Creek, Clifton	..	..	44.1	1	42.8
Maranoa—					
F. R. Rowland Bell	..	..	29.7	5	22
(One competitor, only one prize.)					
Moreton—					
R. Rudd, Upper North Pine	..	..	56.4	5	52
F. Woodford, Samford	..	..	49.9	2	47
S. R. Hulse, Yandina	..	..	48.3	1	47.6
Logan—					
F. M. Birt, Nerang	..	..	46.8	5	41.2
E. L. Marshall, Gramzow	..	..	46.8	2	44
R. A. Tulloch, Veresdale	..	..	41.3	1	39
Burnett and Wide Bay—					
A. Fittell, Eel Creek, Gympie	..	..	63.9	5	67
F. H. J. Hayden, Kingaroy	..	..	59.5	2	55
E. Hayden, Kingaroy	..	..	51.1	1	48
Central Queensland—					
R. J. Philp, Mount Larcom	..	..	58.1	5	72.9
Isabella Wilson, Yeppoon	..	..	57.9	2	62.3
F. Williams, Barmoya	..	..	44.4	1	41.9
North Queensland—					
Mary R. Dougherty, Malanda	..	..	72.4	5	82
J. D. Gellweiler, Kulara, Cairns	..	..	58.7	2	61
R. Vance, Barrine	..	..	47.2	1	44.3

SPECIAL PRIZE WINNERS.

- J. R. C. Hart, Blackbutt (West Moreton), £10.
 N. S. Smoothy, Pinelands, Crow's Nest (Darling Downs North), £5.
 H. W. Abel, Geham, Crow's Nest (Darling Downs North), £3.



PLATE 15.—STUD-SEED MAIZE AND CORN-GROWING COMPETITION EXHIBIT, DEPARTMENTAL COURT (AGRICULTURE AND STOCK), NATIONAL ASSOCIATION SHOW, BRISBANE, 1915.

EXHIBITION NOTES, 1915.**MILK TESTS.**

National Champion Butter-fat test. £25 special prize, and a cash prize of £2 2s. yearly to the winner (presented by the Brisbane Newspaper Co., Ltd.). To be won three times by the same exhibitor, but not necessarily to be in succession or by the same exhibit. Cow, 4 years and over, averaging the greatest daily yield of butter-fat for 48 hours:—

—	—	Milk, Lb.	Test.	Com- mercial Butter.	Average, 24 Hours.	Lact. Points.	Total, 24 Hours.
C. Bloss's Canary, Jersey	M.	20.1	3.2	.70	38.64
	E.	18.9	4.6	.95	..	..
	M.	17.12	4.3	.84	..	0	
	E.	18.2	4.2	.84	26.64	12	
Messrs. McIntyre Bros.' Handsome, Milking Shorthorn	M.	28.6	3.2	.98	..	0	37.04
	E.	29.0	3.6	1.14	..	..
	M.	31.11	3.7	1.28	..	..
	E.	28.1	4.0	1.23	37.04	..	
D. Dunn's Blossom III., Illawarra ..	M.	27.8	3.0	.89	32.7
	E.	26.9	3.4	.98	..	..
	M.	27.6	3.4	1.01	..	..
	E.	25.8	4.0	1.12	32	7	
J. and L. Paten's Jeanette of Wanora, Ayrshire	M.	23.9	4.5	1.18	..	0	31.68
	E.	20.12	4.2	.96	..	..
	M.	23.9	3.5	.89	..	..
	E.	21.1	4.0	.93	31.68	..	
D. Dunn's Jemima II. of Valley View, Illawarra	M.	27.1	2.6	.75	..	0	31.36
	E.	25.14	4.1	1.17	..	..
	M.	25.12	3.9	1.10	..	..
	E.	22.22	3.7	.90	31.36	..	
H. Marquardt's Roan, Milking Shorthorn	M.	18.12	3.8	.78	29.96
	E.	18.4	4.1	.82	..	..
	M.	17.10	3.6	.69	..	..
	E.	18.5	4.1	.83	24.96	5	
W. F. Hammell's Plum, Grade ..	M.	19.12	3.7	.80	28.06
	E.	17.15	4.4	.87	..	..
	M.	17.13	3.5	.65	..	..
	E.	17.12	4.1	.80	24.96	3.1	
V. Goodger's Pansy	M.	24.6	4.1	1.10	25.84
	E.	14.2	4.5	.70	..	..
	M.	19.15	2.9	.62	..	..
	E.	17.6	4.2	.81	25.84	0	
W. Middleton's Ruby of Devonport, Milking Shorthorn	M.	17.8	3.2	.61	25.60
	E.	16.14	4.7	.88	..	..
	M.	18.0	4.5	.90	..	..
	E.	16.11	4.4	.81	25.60	0	
V. Goodger's Roaney	M.	18.6	3.5	.70	24.16
	E.	17.2	4.8	.91	..	..
	M.	16.12	3.0	.54	..	..
	E.	17.13	4.4	.87	24.16	0	
E. Burton's King Lear's Buttercup, Jersey	M.	17.6	3.6	.68	21.54
	E.	16.0	4.1	.72	..	..
	M.	15.4	3.6	.66	..	..
	E.	12.6	4.6	.63	21.04	.5	
W. Middleton's Maggie, Milking Short- horn	M.	23.9	2.3	.57	21.12
	E.	24.10	2.9	.76	..	..
	M.	27.0	2.3	.65	..	..
	E.	24.15	2.5	.66	21.12	0	

BUTTER AWARDS.

Following are the awards in the Butter Section:—

SALT BUTTER WITHOUT PRESERVATIVE, SUITABLE FOR EXPORT.

	Flavour	Texture.	Col.	Salting.	Packing and Finish.	Totals.
Caboolture Co-operative Dairy Co., Ltd., Caboolture	55	19½	7	4	4	89½
Stanley River Co-operative Dairy Co., Ltd., Woodford	54	19½	7	4	4	88½
Killarney Dairy Co., Ltd., Killarney ..			Disqualified.			
Warwick Butter and Dairying Co., Ltd., Warwick	57	18	6	4	4	89
Warwick Butter and Dairying Co., Ltd., Allora	57	18½	7	4	4	90½
Warwick Butter and Dairying Co., Ltd., Texas	58½	19	6½	4	4	92
Marburg Butter Factory, Marburg ..	54	18½	6	4	4	86½
Mount Bismarck Co-operative Dairy Co., Mount Bismarck			Disqualified.			
Downs Co-operative Dairy Co., Ltd., Too- woomba	59½	19½	7	4	4	94
Logan and Albert Co-operative Dairy Co., Ltd., Beaudesert	52	18½	7	4	4	85½
Inverell Co-operative Butter Co., Ltd., Inverell, N.S.W.	56	19	6½	4	4	89½
Queensland Farmers' Co-operative Co., Ltd., Booval	55	19	6½	4	4	88½
Queensland Farmers' Co-operative Co., Ltd., Boonah	58	20	7	4	4	93
Queensland Farmers' Co-operative Co., Ltd., Grantham	55	20	7	4	4	90
Queensland Farmers' Co-operative Co., Ltd., Laidley			Disqualified.			
Atherton Tableland Co-operative Butter and Bacon Co., Ltd., Atherton			Disqualified.			
Oakey District Co-operative Dairy Co., Oakey	53	19½	7	4	4	87½
Goombungee Co-operative Dairy Co., Ltd., Goombungee	59	19½	7	4	4	93½
Kin Kin Co-operative Dairy Co., Ltd., Kin Kin	54	19	7	4	4	88
Silverwood Dairy Factory, Ltd., Terror's Creek	55	19	7	4	4	89
Silverwood Dairy Factory Co., Ltd., Gatton	53	19	7	4	4	87
Maryborough Co-operative Dairy Co., Ltd., Kingaroy			Disqualified.			
Maryborough Co-operative Dairy Co., Ltd., Biggenden			Disqualified.			

Taking into consideration the closeness of the complete results in the case of the Downs Co-operative Dairy Co., Ltd., Tooowoomba, which was only half a point behind the Goombungee Co-operative Dairy Co., Ltd., the judge recommended that an additional prize be awarded.

AGGREGATE AWARD.

Special prize for the factory securing the highest aggregate number of points in all classes, and special prizes.

	Un-salted, Factory Made.	Fresh, Factory Made.	Export, 30 Days, Storage.	With- out Pre- serva- tive.	Export, 8 Weeks, Storage.	Aggre- gate.
Goombungee Co-operative Dairy Co., Ltd., Goombungee	96	95	93	93½	93	470½
Downs Co-operative Dairy Co., Ltd., Too- woomba	95½	94½	94½	94	91½	470
Queensland Farmers' Co-operative Co., Ltd., Grantham	92½	93	95½	90	95	466
Queensland Farmers' Co-operative Co., Ltd., Boonah	91½	90½	91½	93	94½	461
Inverell Co-operative Butter Co., Ltd., Inverell, N.S.W.	92½	92	92	89½	91	457
Warwick Butter and Dairying Co., Ltd., Texas	91	90½	90	92	89½	453
Warwick Butter and Dairying Co., Ltd., Allora	91½	90½	88	90½	89½	450
Silverwood Dairy Factory Co., Ltd., Terror's Creek	91	89	90	89	90½	449½
Marburg Butter Factory, Marburg ..	93	90	90	86½	89½	449
Silverwood Dairy Factory Co., Ltd., Gatton	90½	91	91	87	89	448½
Queensland Farmers' Co-operative Co., Ltd., Booval	91	90½	90½	88½	88	448½
Oakey District Co-operative Dairy Co., Oakey	89½	88½	87½	87½	90	443
Stanley River Co-operative Dairy Co., Ltd., Woodford	90½	89½	89	88½	85	442½
Kin Kin Co-operative Dairy Co., Kin Kin	89½	89½	87	88	88	442
Warwick Butter and Dairying Co., Ltd., Warwick	91	87½	82	89	90½	440
Logan and Albert Co-operative Dairy Co., Ltd., Beaudesert	90½	88½	89	85½	86	439½
Maryborough Co-operative Dairy Co., Ltd., Kingaroy	90	92	92½	..	92½	367
Mount Bismarck Co-operative Dairy Co., Mount Bismarck	90½	91½	90	..	91	363
Queensland Farmers' Co-operative Co., Ltd., Laidley	91	91½	89	..	88	359½
Caboolture Co-operative Dairy Co., Ltd., Caboolture	91	89	87½	89½	..	357
Maryborough Co-operative Dairy Co., Ltd., Biggenden	89½	86½	87	..	85½	348½
Killarney Dairy Co., Ltd., Killarney ..	85½	85½	90	..	87	348
Maleny Co-operative, Maleny	88½	86	88½	..	84¼	347½

Subsequent to the awards being made known, the judge, Mr. G. S. Stening, stated to a representative of the "Brisbane Courier" that the sections judged by him (butter, cheese, bacon, hams, and lard) showed a great improvement on former exhibits of their kind, not so much from points of excellence, but rather from the aspect of general consistency of quality. The points for the winning butters, he said, might not be as high as those in former years, but there was a greater number of butters coming into first grade than hitherto. This in itself was a striking evidence of the educational bearing that exhibits of this nature had upon manufacturers showing in the several sections. The drought the dairying districts had passed through in this State was no doubt a factor in the want of excellence on account of the part played by the breed of cattle and the quality of the pastures at the time the

butter or cheese was manufactured for show purposes. In butter, outside the flavour, the manufacture showed a striking improvement, and with the exception of a few exhibits, compared more than favourably with that of New South Wales. However, there was one detail in manufacture requiring further attention, and that was the working of the butter, for unless the working was sufficiently carried on not only texture faults, but faults in colour, were sure to arise. With this defect overcome the manufacture of the butters would be all that could be desired.

CHEESE AWARDS.

The competition for the prizes in the cheese section was considerable, and of the successful competitors the Southwood Co-operative Dairy Company carried off three first prizes in the six classes. The Rosalie Cheese Factory at Leyburn annexed two firsts and the Leyburn Dairy Company, Limited, came first for matured cheeses. The awards were:—

	Flavour.	Texture.	Colour.	Finish.	Total.
Two Exports, 70-80 lb., White, Suitable for English market.					
Possible points	50	25	15	10	100
J. Wilson, Worongary, S. C. line	40	24	15	9½	88½
Warwick Butter and Dairying Co., Elbow Valley	42½	24	15	9	90½
Westmore Cheese Factory, Westmore, <i>via</i> Kilarney	42	24½	15	9½	91
Rosalie Cheese Factory, Glencoe	42	24	15	9	90
Southbrook Co-operative Dairying Co., Southbrook	45	25	15	9½	94½
Downs Co-operative Dairy Co. Cheese Factory, Hodgson's Vale	45	24½	15	9½	94
Mount Tyson Farmers' Co-operative Dairy Co., Ltd., Mount Tyson	44	24½	15	9	92
Two Exports, 70-80 lb., Coloured, Suitable for English market.					
J. Wilson, Worongary,	40	24	15	9½	88½
Warwick Butter and Dairying Co., Elbow Valley	42	24½	14½	9	90
Westmore Cheese Factory, Westmore, <i>via</i> Kilarney	40½	24½	15	9	89
Rosalie Cheese Factory, Glencoe	43	24½	15	9½	92
Southbrook Co-operative Dairy Co., Southbrook	45	25	15	9	94
Downs Co-operative Dairy Co., Hodgson's Vale	44½	24½	15	9	93
Kooroongarra Co-operative Dairy Co.	43½	25	15	9	92½
Mount Tyson Farmers' Co-operative Dairy Co., Ltd.	43	24½	15	9	91½
Two Medium not exceeding 40 lb. matured.					
Warwick Butter and Dairying Co., Elbow Valley	40	25	15	9	89
Rosalie Cheese Factory, Glencoe	42	25	15	9½	91½
Southbrook Co-operative Dairy Co., Southbrook	38½	24½	15	9	87
Westmore Cheese Factory, Westmore, <i>via</i> Kilarney	39	24½	15	8½	87
Rosalie Cheese Factory, Glencoe	44	24½	15	9½	93
Southbrook Co-operative Dairy Co., Southbrook	40	24	15	8½	87½
Downs Co-operative Dairy Co.'s Cheese Factory, Hodgson's Vale	42½	24½	15	9½	91½
Biddeston Co-operative Dairy Co., Ltd., Biddeston, <i>via</i> Oakey	41½	24½	15	9	90
D. Keir, Bellthorpe, <i>via</i> Woodford	40½	24	15	8½	88
Greenmount Dairy Co., Ltd., No. 3 Factory, Greenmount	40½	24	15	9	88½
Greenmount Dairy Co., Ltd., No. 3 Factory, Greenmount	41½	24½	15	9	90
Greenmount Dairy Co., Ltd., No. 2 Factory, Greenmount	40½	24	15	9	88½
Greenmount Dairy Co., Ltd., No. 6 Factory, Greenmount	41½	24	15	9	89½
Greenmount Dairy Co., Ltd., No. 6 Factory, Greenmount	43	24½	15	9½	92

	Flavour.	Texture.	Colour.	Finish.	Total.
Two Loaf Cheeses, not exceeding 12 lb., under two months old.					
Greenmount Dairy Co., Ltd., No. 3 Factory, Greenmount	43	24½	15	9	91½
J. Wilson, Worongary, S.C. line	41½	24½	15	9½	90½
Warwick Butter and Dairying Co., Elbow Valley	41½	24½	15	9	90
Westmore Cheese Factory, Westmore	39	24	15	9	87
Westmore Cheese Factory, Westmore	39½	24	15	9	87½
Rosalie Cheese Factory, Glencoe	42	24½	15	9½	91
Southbrook Co-operative Dairy Co., Southbrook	43½	24½	15	9	92
Kooroongarra Co-operative Dairy Co., Kooroongarra	41	24½	15	9	89½
Downs Co-operative Dairy Co., Ltd., Toowoomba	42	24½	15	9½	91
Biddeston Co-operative Dairy Co., Ltd., Biddeston	41	24	15	9	89
Leyburn Dairy Co., Ltd., Roma street, Brisbane	41½	25	15	9	90½
Pittsworth Dairy Co., Ltd., Pittsworth	42	24½	15	9	90½
Moola Cheese Factory, Braeside, <i>via</i> Dalby ..	41	24½	15	9	89½
Downs Co-operative Dairy Co., Ltd., Toowoomba	41½	24	15	9	89½
Biddeston Co-operative Dairy Co., Ltd., Biddeston, <i>via</i> Oakey	41	24½	15	9	89½
Leyburn Dairy Co., Ltd., Roma street, Brisbane	44	24½	15	9½	93
Mount Tyson Farmers' Co-operative Dairy Co., Ltd.	44	24½	15	8½	92
Greenmount Dairy Co., Ltd., No. 3 Factory, Greenmount	41	25	15	9	90
Greenmount Dairy Co., Ltd., No. 2 Factory, Greenmount	41	25	15	9	90

Two Medium, not exceeding 40 lb., under two months old.

J. Wilson, Worongary, S.C. line	40	24½	15	9½	89
Warwick Butter and Dairying Co., Ltd., Elbow Valley	42	24	15	8½	89½
Westmore Cheese Factory, Westmore, <i>via</i> Killarney	41	24	15	9	89
Rosalie Cheese Factory, Glencoe	44	25	15	9½	93½
Southbrook Co-operative Dairy Co., Southbrook	42	25	15	9	91
Kooroongarra Co-operative Dairy Co.	43½	25	15	9	92½
Downs Co-operative Dairy Co., Ltd., Toowoomba	43	24½	15	9	91½
Leyburn Dairy Co., Ltd., Roma street, Brisbane	42	24½	15	9	90½
Pittsworth Dairy Co., Ltd., Pittsworth	42	25	15	9	91
Moola Cheese Factory, Braeside, <i>via</i> Dalby ..	41	24½	15	9	89½
Moola Cheese Factory, Braeside, <i>via</i> Dalby ..	42	24½	15	9	90½
Burnside Cheese Factory, Tannymorel	42	25	15	8½	90½
Cambooya Dairying Co., Ltd., Cambooya (No. 1)	40	24	15	9	88
Cambooya Dairying Co., Ltd., Cambooya (No. 2)	39	24	15	9	87
Greenmount Dairy Co., Ltd., No. 3 Factory, Greenmount	42	24½	15	9½	91

Two Loaf Cheeses not exceeding 12 lb. matured.

Warwick Butter and Dairying Co., Elbow Valley	38	24	15	8½	85½
Moola Cheese Factory, Braeside	40½	24½	15	9	89
Burnside Cheese Factory, Tannymorel	42	24½	15	9	90½
D. Keir, Bellthorpe, <i>via</i> Woodford	40½	24½	15	9	89
Wm. Smith, Yangan	41	24½	15	8½	89
Cambooya Dairy Co., Ltd., Cambooya (No. 1)	40½	24	15	9	88½
Cambooya Dairy Co., Ltd., Cambooya (No. 2)	42	24	15	9	90

COTTAGE GARDEN COMPETITION.

It is many years since the National Association first offered a prize for the best cottage garden in and in the suburbs of Brisbane, and it is highly satisfactory to find that the Council of the Queensland National Association have this year offered substantial prizes for the laudable purpose of encouraging a taste for flower and vegetable gardening in Brisbane and its suburbs, and the satisfactory response to the Association's invitation to compete in this section affords good evidence that the movement has been greatly appreciated. In the year 1881 we ourselves obtained the Society's medal and certificate in the only competition of this description which had been held up to that date. There were, if our memory serves us, seventeen entries, and the conditions were much the same as those laid down for competitors in the Cottage Garden Section in August, 1915.

The revival of the garden competitions cannot but have a beneficial effect in the direction of beautifying the surroundings of suburban dwellings, and incidentally will possibly lead to the establishment of a very lucrative business in the cut-flower trade. This year, 36 gardens competed, and were judged by Messrs. J. Soutter and Mr. J. F. Bailey, Colonial Botanist, who remarked on the area, soils, plants, &c., that there was a great sameness in the laying out of the gardens, and that in some districts, notably Paddington, there was a want of the first essential for successful gardening—i.e., water, and much patience and industry had been shown by competitors in that district to overcome the difficulty.

The following are given as the results obtained by the first twelve of the competitors:—

The numbers represent—1, general effect in laying out gardens, &c.; 2, variety and condition of plants; 3, quality of flowers and foliage plants; 4, quality and quantity of vegetables; 5, condition of garden generally:—

—	1	2	3	4	5	Total.
W. F. Greenslade, Clayfield	12	6	9	12½	9	48½
J. Smith, Church street, Red Hill ..	12½	7	9	11	8	47½
W. Brewster, Byrne Estate	12	7	12	8	8	47
Mrs. Grenning, Zillmere	10	7	10	11	8	46
J. H. Buxton, Bowen Hills	12	7	9	10	7	45
H. Hacker, off Bowen Bridge road ..	12	7	9	9	6	45
C. Short, Toowong	10	7	13	10	6	45
Jas. Hamilton, Kennedy terrace ..	10	7	9	12	6	44
R. Fulcher, Kennedy terrace	11	8	11	7	7	41
R. Littleford, View street, Paddington ..	9	7	9	12	7	44
W. Bell-Booth, Duke street, Thompson Estate	10	7	8	10	7	42
R. J. Street, Duke street, Thompson Estate	10	7	9	9	7	42

The judges in their report state that the first and second prizes were won by elderly gentlemen, who seemingly devote the whole of their time to tending their gardens, and, therefore, may be considered to have an advantage over those who, having occupations which take them daily from home, can only spare odd times for the work, but this is not a point to be taken into consideration by the judges. Several of the competitors were handicapped by having paid little or no attention to the vegetable portion of their gardens. In one of these gardens—namely, that of Mr. P. Dowd, of Bell street, Kangaroo Point, was an illustration of what good effect may be obtained from grass and shrubs, with a touch of the old-fashioned carpet-bedding. The whole area is laid down in grass with roses and other shrubs dotted here and there, and is kept in beautiful order. Another, at Clayfield, was tended solely by Mr. Scott, a young man employed by the Tramways Company. This garden is most tastefully laid out, and the massing of plants of one kind will be sure to prove effective later on in the spring. Mr. Thomas's garden at Indooroopilly could only be judged so far as flowers and vegetables were concerned, as the large area at the disposal of the owner placed it at an advantage far beyond that of one eligible for competition as a "cottage garden." Here are to be seen some fine palms and other trees bordering the drive, and placed on the lawns. A feature of this garden is a hedge composed of pink and red Bougainvilleas, the gorgeousness of which is almost beyond description. The pink variety is also used with beautiful effect trained along the veranda. It would be worth while for anyone interested to take a trip along Hart's road to see the effect produced by using these plants in this manner. Mr. Greenslade's garden is an ideal "cottage garden," sufficient plants being grown to beautify the home on the one hand, and to supply the household requirements on the other hand. Mr. Smith's effort has been made under most unfavourable conditions so far as position is concerned, as it stands on the side of a steep hill, with a low depth of soil to work upon. The leading feature of Mr. Brewster's garden is the excellent display of sweet peas and Shasta daisies. In each garden every inch of space has been used to advantage.

We are indebted to the courtesy of the Secretary of the National Association for the following correct list of prize-takers in the District and One-Farm Exhibits for the past thirteen years.

DISTRICT EXHIBITS.

First Award.

1903—5 Competitors	...	...	...	...	Moreton Districts, Nundah, and Zillmere.
1904—7 Competitors	...	...	...	...	Moreton—Combined Moreton Association.
1905—8 Competitors	...	...	...	...	Moreton.
1906—5 Competitors	...	...	...	...	Wide Bay and Burnett and Moreton—equal.

1907—3 Competitors	Moreton.
1908—3 Competitors	Central Queensland.
1909—5 Competitors	Wide Bay and Burnett.
1910—No entries.	
1911—"A" Grade, 1 Competitor ...	Central Queensland.
"B" Grade, 3 Competitors ...	Lowood and Tarampa District.
1912—"A" Grade, 3 Competitors ...	Central Queensland.
"B" Grade, 2 Competitors ...	Kingaroy.
1913—"A" Grade, no entries.	
"B" Grade, 5 Competitors ...	Fassifern.
1914—"A" Grade, 2 Competitors ...	North Coast Agricultural Societies' Union, Lismore, N.S.W.
"B" Grade, 8 Competitors ...	Fassifern.
1915—"A" Grade, 3 Competitors ...	South Coast District Display Association.
"B" Grade, 5 Competitors ...	Gympie.

ONE-FARM EXHIBITS.

First Award.

1910—6 Competitors (and 1 non-competitive)	Prevost Brothers, Moss Vale, N.S.W.
1911—1 Competitor	Allen, D. H. A. and W., Chatsworth,
1912—2 Competitors (and 1 non-competitive exhibit)	Gympie. Muller, T. P., Tirroan, Gin Gin.
1913—2 Competitors	Franke, H., Cawdor.
1914—5 Competitors	Todd, A. P., Rockhampton.
1915—3 Competitors (one retired)	Williams, O. C.

HOUSEHOLD HINTS.

THE VALUE OF VINEGAR.

All housewives would seldom be without vinegar on the kitchen shelf if its value were more widely known.

Its usefulness in the household can hardly be over-estimated, as there are a surprisingly large number of duties that can be rendered comparatively easy by its application.

The boiling of eggs when the shells are cracked sometimes proves a little difficult. When this happens, add a small quantity of vinegar to the water, and the egg will be cooked as satisfactorily as if the shell had been undamaged.

Where it is desired to keep meat, and the more costly methods are impossible, the use of vinegar will again overcome the difficulty. Simply wrap the meat in a cloth wet with vinegar and it will be kept nice and fresh. Wash off the vinegar before cooking operations.

Vinegar heated to boiling-point will also be found a most effective softener of hard brushes which have become dry and otherwise too hard to use.

Then, a little vinegar rubbed over the hands when they have become red and discoloured through rough work or too frequent dabbling in soapy water will greatly improve and whiten them.

Pastoral.

SETTLERS' FLOCKS ON COASTAL LANDS.

Mr. J. R. Chisholm writes us as follows from The Plains, Prairie, N.Q.:—

Since writing my paper on settlers' flocks, I have been through from Gladstone to Tamworth, in New South Wales, by rail, and I think now, by what I saw of some lands, and what I heard from those I travelled with and met, that I may have treated the matter of worms in coast-kept sheep too lightly. Will you therefore please give me space for a few lines more on this subject.

Although in my paper I referred to coast flocks in the North being successfully kept, and with little attention, yet these I know are on sweet country, and I saw much land—between Bundaberg and Maryborough, for instance—that, I should say, was not sweet, and I would say there may be areas about Gatton, Helidon, and thereabouts also wormy country; and I spoke with a New England man in the train, and he tells me of much of his district where the sheep have to be drenched continually to keep them healthy. Throughout New Zealand they grow good sheep and superfine wools, and those seen from the train look healthy enough; hence stockowners there must deal with worm troubles successfully.

My object in writing is to encourage the small settler to keep sheep, and just now is his opportunity, for breeding sheep from the Longreach district could be bought cheaply, and they would be merinos; but a settler buying a little lot, of 25 to 50, could get a Lincoln, Corriedale, or Border Leicester ram, or a good Shropshire or Romney, when he would soon have big lambs, and could pot the ewes for his pigs. However, I was going to refer to worms in sheep, and wished to emphasise the ease with which a small flock is handled. Some years ago we got some Lincoln rams from South Australia, and, unknown to me, they were transhipped in Sydney, and kept in a wormy paddock out by Rooty Hill for a few days. When they came here I let them go with sheep in a paddock, and some time afterwards I saw they were doing no good; so I got Mr. Collins, the stock inspector, then at Hughenden, to come down. He had been about the Burnett country as a lad, when it was all sheep-stocked, and he said at once that the rams were wormy. I said they had come off a sound country in South Australia and this could not be. However, we killed one, and found both tape and stomach worms (the little red fellows). We at once drenched the rams with an arsenic drench, but it was a good while before they did any good; and, by the way, the Lincolns were never very much of a success here. However, some time afterwards, we found worms in the sheep where these rams had been, and we drenched 1,500 of them in half a day—quite effectively, too, because we never

had any more worm trouble; but, as I said in my paper, ours is a dry country. Think, then, how quickly a home flock could be handled.

At that time, however, we read up a good deal of literature on worms in sheep, and to me, anyone who could talk worms in sheep was congenial company. Much of my reading goes to show that most sheep worms find their resting places by the medium of dirty water. Little waterholes and small excavations would be the home of worm eggs in dry weather. The man who waters his sheep out of troughs supplied from a well will have less trouble than his neighbour with a small dam or tank excavation.

In many of the American States sheepowners have worm troubles. They give common salt in plenty, and sulphate of iron, about 2 oz. of the latter to 1 lb. of salt. The sulphate of iron must be added to the salt a little at a time, otherwise you may put the sheep off it. A popular worm remedy in American sheep husbandry is gasoline. They add this to the lick, only a drop or two at first, to get the sheep used to the smell of it, then add little by little. Turpentine and coal tar mixed would be about equal to the gasoline. I believe in turpentine as a worm remedy for all stock, and for sheep it is popular and effective in many countries. The dose is one cup of turpentine to two cups of milk, giving the grown sheep half of a small-sized sauce bottle to each dose, after starving them for twenty-four hours. Keep them in for a few hours, and then let them out for a feed, and shut them in again, watching the droppings for results. In all dosing and medicinal matters, one must be guided by results and see what good is done by the dosing, so that the treatment may be known to be effective or, if otherwise, that some other may be substituted. Home flocks of sheep should be quiet, ready feeders and, where this is so, they can easily be given any medicine mixed with food, provided judgment is exercised in mixing a very little at a time so that they may not be put off it.

The treatment I have suggested may deal with stomach worms and tapeworms successfully. Where the more malignant varieties of worms affecting the head, liver, and lungs of sheep are found, it is matter for consideration if the land cannot be put to better profit than may accrue from sheep.

WHEAT AND GRASS CULTIVATION.

By P. R. GORDON.

If the present disastrous European war has the effect of greatly extending the cultivation of wheat in Queensland, it will also, incidentally, greatly benefit the meat export trade and the pastoral industry generally. Many thoughtful men among the pastoralists hold the opinion that the time is not far distant when the cultivation of exotic grasses on much of the available waste lands on the coast watershed, and for many miles inland, west of the coast range, will be resorted to by many of our more enterprising graziers, and the extension of wheat growing will provide the very best conditions for inaugurating such a system.

It will, of course, be known to many of our wheatgrowers that the first great impetus to wheatgrowing in New South Wales was by the inauguration of what is known as the share-system of cultivation. This system was initiated about twenty-five or thirty years ago by the late Hon. George H. Greene, of Iandra Station, Grenfell district, New South Wales. He contracted with farmers and others without capital, men possessing a practical knowledge in the growth of crops, to plough the land, plant the seed, and harvest the crops; he, on his part, giving the use of the land free of rent, providing the seed wheat, and in some if not in all cases advancing the money to provide the necessary farming implements. It is also known to the writer that he was willing to lend the free use of young horses to those of the cultivators who cared to break them into harness. When harvested, the crop was shared in equal parts between the owner of the land and the cultivators. The system soon became general and rendered New South Wales the only State of the Commonwealth in a position to export a large surplus of wheat. Two crops of wheat in succession were thus taken off the same land, when the cultivators were moved on to another portion of virgin soil. The land from which the wheat crop had been taken was either allowed to return to indigenous grasses or planted with exotic grasses. If the former, it is well known to men of experience that the native pasture is greatly improved by the breaking up of the surface soil, and cattle and sheep always prefer it to pasture on undisturbed soil. It is not the object of the present writing to trace the effect that the share-system has had on the production of wheat in New South Wales, but to show the splendid opportunity the system offers for laying down in cultivated grasses large areas of land, thus greatly increasing its grazing capabilities, both for dairying purposes and for the fattening of stock, thus coming into line with other countries, such as New Zealand and Argentine, in fattening off cattle at early ages, and thus bringing the quality of our beef more in accordance with the requirements of our butchers and tastes of foreign meat consumers. In normal times there are always available plentiful supplies of store cattle from the larger inland grazing holdings, and farms of improved pasture could be very profitably used in the fattening of store stock. There are many excellent exotic fodder-grasses that have taken kindly to the Queensland climate, among others, lucerne, Rhodes grass, *Paspalum dilatatum*, sheep Burnett, fescue, &c.; and the late Mr. F. M. Bailey, the veteran Government Botanist, pointed out many of our indigenous grasses which not only were of great value as fodder plants but which were greatly improved in their habits of growth and in quality by cultivation. The practice in Great Britain and other countries in the Northern Hemisphere, when laying down fields in pasture, is to sow the grass seeds with the wheat or oat crops, as the case may be; the cereal crop affording the necessary protection from the sun during their earlier growth. This could easily be carried out when sowing the second crop of wheat. This has the double advantage, in countries where straw forms an important item in cattle food, in rendering it more digestible and palatable for the stock. The experience of Queensland farmers who have experimented with Rhodes and other

grasses of rank growth will suggest to them whether they would be apt to overshadow the wheat crop before the latter arrives at maturity. That the cultivation of pastures would immensely increase our annual "cast" of fat cattle and sheep, in addition to improving the quality of the meat, will be regarded as a matter of course, and that it would largely increase the flow of milk in dairy herds is equally self-evident.

FEEDING AND MANAGEMENT OF MILCH GOATS.

Feeding is an important question, and naturally one is desirous of obtaining the best results combined with economy. Whether goats are kept tethered or running at large, the best fodder for hand feeding is prime lucerne chaff, and bran together with linseed meal and sweet potatoes, as a valuable addition to the diet, and to give variety.

If kept tied up, the ration should consist of the following proportions, to be given twice a day, morning and night, preferably at milking time, viz.:—Prime lucerne chaff, 2½ lb.; bran, 3 single handfuls; linseed meal, half handful; sweet potatoes, cut up, 1 lb.

Note.—If the potatoes are given lessen the bran to half. The items mentioned should be mixed well, excepting the cut-up potatoes, which should be placed on top. A little green lucerne is good, but let it wilt for a day or two before feeding, as it might produce hoven otherwise.

It should be borne in mind that it will take nanny at least a fortnight to learn to feed properly, and until she does the yield will not increase.

Bran when made wet acts as an aperient, but when given dry it is a valuable food, so do not wet the bran, as it sours quickly.

Grain of any kind is too heating, and has the effect of putting them back with the milk yield, and if persisted in will dry them off, corn in particular. If a grass plot is available it is an excellent plan to tether them so that they can get a pick. If the available grass is small in area, it is better to cut or pull it, and put it in their manger. They are very fond of milk thistles.

If able to allow the goats their freedom, it is astonishing the variety and amount of food they will collect. Such being the case, the quantities of feed to be given when kept in captivity can be reduced to half or less, depending on the value of what they can find. The milk yield will help to determine this point. A good goat will keep in milk profitably for twelve months, or even longer, but it is not desirable to keep them in more than a year. If this end is to be attained they must be kept away from the buck.

The diet can always be supplemented by bits of bread, potato peelings, and waste from the kitchen, but all such waste must be

clean, else nanny will not eat it, notwithstanding the assertion that they will thrive on jam tins and old boots. Certainly, they are very hardy, but most particular about what they eat.

It is necessary to have a shelter of some kind for them, as they do not like rain or damp places. Always have fresh drinking water on hand, and see that it is not soiled.

In selecting milkers it is best to see them milked before purchasing if possible. It is well to keep the following in mind, viz.—“It takes no more to feed a good animal than a bad one.”

The Angora goat is of no value as a milker; the common goat is by far the best. A nanny that will give two quarts a day when just in must be considered an excellent milker.

Goats' milk will stand one-third its own volume of added water, and will then be richer than ordinary cows' milk, and will be found quite the thing for all ordinary purposes.

THE STOMACH-WORM IN SHEEP.

By W. G. BROWN, Instructor in Sheep and Wool.

[CONTINUED FROM AUGUST NUMBER.]

Another set of experiments conducted by Dr. Theiler will have interest to most sheep farmers in Australia who are grazing sheep on infected country, the subject being—“What is the effect of dosing pregnant ewes?”

The sheep experimented upon were 4, 6, and 8 tooth sheep. The table showed some interesting results, but is too long for insertion here.

Thirty ewes in an advanced stage of pregnancy were dosed with various amounts of Cooper's dip and bluestone, and in only four cases were the lambs born dead. Three of these four cases showed twin lambs which died; the singleton died a few days after birth. Dr. Theiler's conclusions on the experiment are:—

“The dosing of pregnant ewes with the maximal safe dose of Cooper's dip and bluestone was followed, in two instances, by the death of the twins. This may be due to the actual dose, since in one other instance where the twins survived, the ewe had only been dosed with half the safe dose.”

In regard to the use of arsenic in this matter, I met with a curious experience two years ago, at Emerald, in the Central district. A sheep farmer who had some 2,000 ewes about to lamb, informed me that he would like advice about them. Several days later I visited his farm, and, sure enough, found his sheep wormy, and also heavy in lamb. Knowing that ewes with lambs at foot may safely be drenched without injury to the lambs, I advised him to wait, and drench his ewes after

they lambed. He then said triumphantly, "I thought you would say that. I drenched them all two days ago." He used Pottier's dip and got good results. For several weeks I visited these sheep at regular intervals, and found in the end that the lambing was very successful. There is no doubt, however, that he took a big risk, and, in my opinion, an unnecessary one, for reasons stated above.

THE DOSING OF EWES WITH LAMBS AT FOOT.

This question also has interest for us, and another set of tables shows that the dosing of ewes with the maximal safe dose of Cooper's dip and bluestone had no ill effect on the lambs suckled by the dosed sheep.

This is in accordance with facts I have noticed in drenching ewes with the arsenical drench. Absolutely no ill effect on the lambs was to be observed after drenching the ewes with the full dose ($2\frac{1}{2}$ grains).

THE LICK.

"The second method of dosing sheep is by allowing them free access to a lick containing vermifuge ingredients. The danger of this method is, obviously, that sheep may get too much of the lick." Thus Dr. Theiler. My experience is that sheep, after the first day of two, only help themselves sparingly to the salt lick, whatever other ingredients are included.

Dr. Theiler's conclusions after the experiments are—"The free access of sheep to a lick containing Cooper's dip and bluestone for a period of three months, during which time one sheep consumed on an average daily 2.3 grains of Cooper's dip and 2.3 of bluestone, had no decisive effect on the worms. The sheep kept in good condition, but the controls which were not dosed showed exactly the same condition, so that no effect, whether good or bad, could be noticed in the sheep. This experiment should indicate that the method of allowing sheep to partake of vermifuge through the medium of a lick is by no means a method which can be considered to be preferable to the dosing of the sheep with the optimal doses."

Other drenches than Cooper's dip and bluestone were tried by Dr. Theiler, and from time to time I shall make extracts from his published conclusions on these. It is a matter of such importance to this country that all information should be searched for and spread broadcast. The pest is making headway fast in almost every district in Queensland, excepting the very far West. It is only reasonable to conclude that even there it is possible that once these parasites get a footing, as much loss and trouble will be caused by the parasite as in the closer settled areas nearer the coast. I know that they are in as dry areas as are to be found in Queensland, as at Alpha, Jericho, Augathella, Surat, Yeulba, &c., which are surely dry enough areas, yet worms are to be found a pest in these districts.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RECORDS OF COWS FOR MONTH OF JULY, 1915.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commer- cial Butter.	Remarks.
			Lb.	%	Lb.	
Noble Dot ...	Jersey ...	2 May, 1915	612	4·6	33·17	
Lady Twylish	„ ...	5 June „	562	4·7	31·14	
Netherton Belle	Ayrshire ...	23 April „	630	4·2	31·10	
Bluebelle ...	Jersey ...	20 June „	724	3·6	30·53	
Iron Plate ...	„ ...	21 Feb. „	466	5·4	29·75	
Miss Bell ...	„ ...	2 July „	514	4·2	25·38	
Lark ...	Ayrshire ...	17 June „	618	3·4	24·55	
Black Bess ...	Jersey ...	4 June „	471	4·2	23·23	
Lady Athol	Shorthorn...	29 May „	545	3·6	22·99	
Lady May ...	Ayrshire ...	7 Mar. „	513	3·6	21·64	
Lady Lil ...	Jersey ...	27 June „	410	4·2	20·23	
Cocoatina ...	„ ...	6 Mar. „	332	4·9	19·18	
Thornton's Fairetta	„ ...	27 Mar. „	325	4·7	18·0	
Lady Melba	Holstein ...	6 Mar., 1914	413	3·7	17·90	
Nellie II. ...	Shorthorn...	20 July „	428	3·5	17·52	
Miss Melba	Holstein ...	22 Nov. „	459	3·2	17·12	

The following cows were stall fed, in preparation for Brisbane Exhibition :—Noble Dot, Netherton Belle, Iron Plate, and Black Bess. The remainder of the herd grazed on natural pastures, supplemented by a ration of ensilage.

DRIED YEAST AS FOODSTUFF.

With the increased prices of imported concentrated foodstuffs, it is desirable that farmers should keep their eyes open for any new sources of suitable foods which may be available.

Such a food, according to an article appearing in the Journal of the Board of Agriculture, appears to be dried yeast.

In Germany it is estimated that the output of brewers' yeast is about 69,000 tons a year, a large proportion of which is subjected to the drying process and sold for stock feeding. The small quantity of dried yeast prepared in this country has been mainly exported to Germany, where the product has grown in favour so rapidly that the demand is said to have exceeded the supply. The high percentage of albuminoid in dried yeast is a feature to be noted. From various

analyses it appears to contain from 45 to 50 per cent. of this valuable constituent, and in this respect is only equalled amongst ordinary farm foods by decorticated seed meal or cake and soy bean meal and cake.

Feeding experiments with dried yeast have been carried out at Garforth, and the report on the results is of a distinctly favourable character.

It is, therefore, considered opportune by the Board of Agriculture that apart from the exceptional circumstances of the moment, the attention of the British farmer should be directed to this new feeding material, and especially that, if the claims as to its merits can be substantiated, every effort should be made to develop the home demand to such an extent as to render exportation in the future as unnecessary as it is undesirable.

According to the experience gained during the trials, the results were summarised as follows:—

1. Dried yeast has proved a safe food for cows, pigs, and calves.
2. For cows, dried yeast is not to be strongly recommended, since they show a special aversion to its bitter taste.
3. It has proved a good food for pigs, having given results markedly better than those obtained with an equal weight of wheat "sharps." Despite the increased cost of the ration on introducing dried yeast in the place of an equal weight of "sharps," the margin of profit on the feeding has been undoubtedly increased.
4. Dried yeast has proved a safe food for calves, but no evidence has been obtained as to its merits in comparison with other foodstuffs commonly used for calf-rearing.
5. Dried yeast keeps well, and on mixing with other meals and water may be kept for some time without objectionable fermentation taking place.
6. In arriving at these conclusions no account has been taken of the value imparted to the manurial excreta of the animals by the consumption of dried yeast. From its composition, this may be expected to be as high as that of any other foodstuff commonly used on the farm.

7. Although the experience with dried yeast at Garforth, as outlined above, has been favourable, there is no reason to believe, either from the results of experiments or from careful observation of the general health of the animals throughout the tests, that the dried yeast possesses special medicinal or dietetic virtues which any other highly digestible food rich in albuminoids might not be expected to possess.

The Board of Agriculture would, no doubt, be ready and willing to supply information as to the best way of utilising the substance for stock-feeding purposes.—"Mark Lane Express."

The Orchard.

PINEAPPLE MEMOS.

C. F. BARKER, Barmundoo—

Following are replies to your questions:—

Q. 1. What is the average yield of pineapples per acre on fair to good pine land?

Q. 2. What is the average (about) gross profit per acre of pines under safe conditions?

A. 1 and 2. Returns fluctuate. £35 and £80 per acre. 10,000 to 12,000 pines not uncommon, say 10 to 15 tons per acre.

Q. 3. What labour is required? About how many acres can a man keep cleared, manured, and generally attended to?

Q. 4. Does this labour require to be kept at work regularly? In other words, does the planter employ the majority of his hands permanently or only at particular periods, say, when the cultivation requires cleaning or the fruit picking?

A. 3 and 4. Five to 10 acres or more. It depends on the man, nature of the soil, horse or hand labour. Labour may or may not be continuous if it is required to keep the plantation clean and for harvesting the crop.

Q. 5. What is the usual class of labour employed, and at what wages?

A. 5. Ordinary farm or garden hands at the ruling rate of wages for the district.

Q. 6. Is it your opinion that much experience is required to be successful at pinegrowing? What chance has a man without previous experience at fruit-growing of making a success at pine cultivation?

A. 6. No. A good cultivation has a splendid chance.

Q. 7. Is it customary or beneficial to grow other fruits with pines?

A. 7. Ground crops, such as peas, beans, tomatoes, &c., may be grown between the rows for the first year or two, but fertilisers must be used to prevent the pines being robbed of any sustenance.

Q. 8. Does disease frequently destroy a whole crop of pines?

A. 8. No.

Q. 9. Is it your opinion that we are likely to over-produce pines?

A. 9. No.

Q. 10. Could you recommend me any books on pineapple culture?

A. 10. We have no other literature in this connection.

Botany.

LIST OF FRUIT TREES SUITABLE FOR NORTHERN QUEENSLAND.

(Does not include those already commonly grown for the market.)

Alligator Pear	Vi Apple
Breadfruit	Wampee
Jack Fruit	Rambutan
Chinese Raisin	Butter Fruit or Mabola
Litchi	Pulassan
Mangosteen	Rose Apple
Sapodilla Plum	Brazilian Cherry
Star Apple	

Most of the above could be obtained from Singapore.

J. F. BAILEY,

Colonial Botanist.

LIST OF ORNAMENTAL TREES SUITABLE FOR NORTHERN QUEENSLAND.

Exotics.

Albizzia fastigiata, A. Forbesi, A. stipulata.	Myrospermum pereirae (Bal- sam of Peru).
Bauhinia Candida, B. pur- purea, B. splendens, B. variegata.	Poinciana regia (Flamboyant Tree).

Natives.

Cassia fistula (Indian Labur- num), C. nodosa (Golden Chain), C. siamea.	Acacias (a number of species).
Caesalpinia ferrea	Bauhinia Hookeri (Queensland Ebony).
Cinnamomum Camphora (Cam- phor).	Buckinghamia celsissima.
Erythrina caffra, E. indica, E. speciosa (Coral trees).	Castanospermum australe (Moreton Bay Chestnut).
Ficus benjamina (Weeping Fig).	Cupania pseudorhus.
Harpephyllum caffrum (Natal Plum).	Cypress Pine.
Jacaranda mimosæfolia.	Grevillea robusta (Silky Oak) and other species.
Kigelia pinnata (Sacred Bean of Nubia).	Harpullia pendula (Tulip wood).
	Stenocarpus sinuatus (Wheel of Fire).
	Sterculia acerifolia (Flame Tree) and other species.

The above list includes those which can be purchased at nurseries within the State, otherwise there are numerous other trees which could be recommended.

Science.

AIR IN THE SOIL AND EARTHWORMS.

By BENJAMIN WILSON.

Loose soil is a mixture of (1) solid constituents, (2) water, (3) air. It is the last named that we will deal with. Air in the soil is a most important point not considered by many people, though it is absolutely necessary to the successful growth of the crops. All living subterranean parts, like all other living parts, require air (oxygen) for breathing. Only such plants as have large air spaces, connected by passages, can thrive in soil deficient in air—for instance, in very wet soil where the ground water is at the surface. All other plants would die through suffocation. The reason for this is that alcoholic fermentation and the evolution of carbon dioxide is set up, with the inevitable result of death and putrefaction. In soils poor in oxygen, decomposition takes place in a totally different manner from that in aerated soils; humic acids are formed in great quantities, so that the soil becomes sour. Air in the soil differs slightly in composition from that in the atmosphere; it contains more carbon dioxide and less oxygen, particularly so in the subsoil, because of the respiration of subterranean organs, bacteria and animals, and the decomposition of organic bodies. The amount of carbon dioxide varies with the quantity of organic matter in the soil, the crop, the method of cultivation, the contour and humidity of the land, the size of the soil particles, the depth of soil, and the temperature (season).

The aeration of soil depends essentially upon the structure; the more porous and loose the soil is the more complete is the aeration. Natural factors and artificial factors (cultivation) that assist this aeration are many and varied. As these factors are almost universally known, we need not mention them. One natural factor, however, that has a great connection with aeration, and to which the average person is not inclined to place much credit, is the earthworm. Earthworms play special roles in ordinary soil. The role that concerns us here is: By the tunnelling carried out, and the passages made, due to their activity, they render the soil more porous and better aerated. In other words, the soil becomes mellow, thus promoting breathing in the roots and, consequently, growth in the crops. The excrement deposited likewise serves to render the soil more pliable and porous. They also facilitate drainage. The effect of these animals will be patent to anyone if he can realise that it has been calculated that there may be as many as 400,000 in $2\frac{1}{2}$ acres of land. By admitting air to the soil, more plant food is made available, the soil is made warmer, drainage assisted, the soil broken up, breathing promoted, and in fact a large number of definite advantages arising from admitting air, and which will be seen by anyone who pays a little attention to the matter.

Entomology.

EXPERIMENTS IN THE DESTRUCTION OF THE CANE BEETLE.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report from Mr. E. Jarvis, Entomologist to the Bureau:—

As a result of certain field experiments conducted during November and December last, acetylene light was proved to be very attractive to both sexes of our principal cane beetles throughout their aerial existence, such reaction, however, being considerably influenced by various meteorological and other conditions.

The movements of the beetles whilst flying near artificial light were studied, particularly their manner of approaching the trap and behaviour when within a foot or so of the flame; and certain conclusions were arrived at regarding the kind of design most likely to produce a serviceable light trap, and the conditions under which the latter might be expected to yield payable results. As an outcome of these observations, it is proposed to construct an entirely new form of trap for trial during the coming season. Such contrivances usually aim at capturing the insects by means of a shallow tray or pan containing water and kerosene placed under a strong lamp. This principle, however, is not to be commended in the present instance for the following reasons. In the first place, it entails needless labour and expense, which, although small, would nevertheless be appreciable when dealing with a number of traps. Secondly, it would destroy a certain proportion of useful insects, both parasitic and predaceous, which help to control not only the cane beetle in question but a number of other insects pests of sugar cane.

In this connection I may mention that a well-known enemy of cane grubs (*Dielis formosus*), the common "Digger Wasp," and probably beneficial cockroach (*Ellipsidion pellucidus*, Brunn.) which frequents the foliage of sugar cane, are susceptible to the influence of artificial light. An arboreal species of earwig also, which I believe to be predaceous on small lepidopterous larvæ of at least one of our cane pests, is attracted in great numbers.

The grey-backed cockchafer (*Lepidiota alborhirta*) responds to the stimulus induced by acetylene light from a considerable distance, the phototropic influence being well-nigh irresistible, and compelling this insect to advance towards the trap. It rarely flies directly into the flame, but when within a few yards approaches in an erratic manner by a series of short flights, settling at brief intervals on the ground or on cane plants, and finally, as though struggling against the attractive force, plunging headlong downwards at a distance of about a foot or eighteen inches from the light. Our new trap will be fitted with a landing stage

designed to take advantage of the above habit and immediately capture all beetles that may settle or fall upon it and deposit them in a large chamber from which return will be impossible. Suitable exits will, of course, be provided for useful insects such as carabidæ (predaceous ground beetles) and the various hymenopterous parasites.

The light will be protected in such manner as to throw beetles that may attempt to dash into it on to the stage below, to their certain doom, but at the same time prevent the destruction of beneficial species.

By making use of a discovery relating to a peculiar habit connected with the flight of this insect when taking to wing, it will be a simple matter to prevent cane beetles from flying out of the trap.

Recent experiments with regard to the control of *Lepidiota alborhirta* whilst in its larval form have for the most part given negative results, but although apparently inconclusive such work in reality serves a useful purpose by directing investigations into more and still more promising channels which, owing to this gradual process of contraction, must eventually come to focus somewhere, and in all probability reveal a pathway to discoveries of decided economic value.

Whilst stationed at Gordonvale, I have sought to embrace present opportunities for studying the life-history and economy of many insect pests of sugar cane, the majority of which, although of minor importance, include a few decidedly injurious species and several hitherto undescribed forms. Such knowledge is essential to a comprehensive survey of the cane-grub problem, it being, of course, quite possible to advocate control methods that, whilst successful against one kind of pest, may destroy certain natural enemies of another, and so tend to favour an abnormal increase of the latter species.

OIL OF GERANIUM.

Essential oil of geranium is the product of the steam distillation of the leaves and flower of species of pelargonium (*n. o.* Geraniaceæ).

French oil of geranium is obtained from *P. radula*, Algerian oil from *P. roseum* and *P. odoratissimum*.

Various forms of still are used, and inquirers are referred for particulars of these to works dealing specially with the subject of essential oil distillation. Brant's "Practical Treatise on Animal and Vegetable Fats and Oils" may be consulted.

Essential oil of geranium prior to the present war was quoted at from 15s. to 30 per lb. for various grades, the value being based, probably, on geraniol content.

It is pointed out that no operation of essential oil extraction upon a small scale can be expected to compete successfully in the production of an oil which forms the product of a specialised industry in other parts of the world.

General Notes.

A NEW USE FOR PRICKLY-PEAR.

The American Consul in Uruguay says that, when travelling through certain parts, one's attention is attracted to the fine white colour of the farm buildings, even during the wet season. To obtain this neat effect a whitewash is used which is made from the sliced "leaves" of the prickly-pear, macerated in water for twenty-four hours, producing a solution of creamy consistence. To this lime is added and well mixed. When applied to any surface, be it wood, brick, iron, or other material, a beautiful pearly white appearance is produced, which will endure through storms and frosts for many years.

SPLIT PEAS.

"Woodford Marrow" and "Prizetaker" are used for split peas. They should be planted in drills like other peas, and should be sown as a winter crop, say from May to July, and reaped in Spring, before the heat is too great.

CUBIC CONTENTS OF A TANK.

A correspondent at Yelarbon sends the following dimensions of a tank—Top, 107 ft. by 61 ft.; bottom, 68 ft. by 36 ft.; depth, 8 ft.—and asks for the cubic content. Mr. A. Morry, surveyor to the Department, advises as follows:—

"The Prismoidal formula is—Add together the area of the top and bottom, and four times the middle area. Then divide the whole by six, which gives the mean area. Then divide by 27, which gives cubic yards. In this case the following is the result:—

$$\begin{aligned}\text{Area of top} &= 107 \times 61 = 6,527.0 \\ \text{Area of bottom} &= 68 \times 36 = 2,448.0 \\ 4 \text{ times area of middle} &= 876 \times 48.6 = 16,878.0 \\ &\quad 6)25,853.0\end{aligned}$$

4308.10 = mean area
in superficial feet.

Then 4308.10 sup. feet \times 8 (the depth) and divided by 27 gives 1276 $\frac{2}{3}$ cubic yards.

Note.—The middle area is obtained by adding together the length at top and bottom and dividing by 2, and the width at top and bottom, also divided by two. Then multiply the two results together—

$$\begin{array}{r} 107 \quad 61 \\ 68 \quad 36 \\ \hline 2)175 \quad 2)97 \\ \hline 87.6 \times 48.6 = \text{the middle area.} \end{array}$$

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR AUGUST, 1915.

Article.								AUGUST.
								Prices.
Bacon	...	...	...	...	...	...	lb.	11d. to 1s. 0½d.
Bran	...	...	...	...	...	...	ton	£9 10s.
Broom Millet	...	...	...	...	...	...	"	£37 to £40
Butter	...	...	...	...	...	...	cwt.	156s.
Chaff, Mixed	...	...	...	...	...	...	ton	£11 5s. to £13
Chaff, Oaten	...	...	...	...	...	...	"	£13 3s.
Chaff, Lucerne	...	...	...	...	...	...	"	£17 to £17 10s.
Chaff, Wheaten	...	...	...	...	...	...	"	£4 10s. to £5 5s.
Cheese	...	...	...	...	...	...	lb.	11d. to 11½d.
Flour	...	...	...	...	...	...	ton	£20 5s.
Hams	...	...	...	...	...	...	lb.	1s. to 1s. 1½d.
Hay, Oaten	...	...	...	...	...	...	ton	£12 10s.
Hay, Lucerne	...	...	...	...	...	...	"	£6 to £7
Honey	...	...	...	...	...	...	lb.	3½d. to 4d.
Maize	...	...	...	...	...	...	bush.	4s. 10d. to 5s. 3d.
Oats	...	...	...	...	...	...	"	6s. 6d.
Onions	...	...	...	...	...	...	ton	£10 10s.
Peanuts	...	...	...	...	...	...	lb.	3d. to 4d.
Pollard	...	...	...	...	...	...	ton	£9 10s.
Potatoes	...	...	...	...	...	...	"	£5 to £11
Potatoes (Sweet)	...	...	...	...	...	...	cwt.	1s. 9d. to 5s. 10d.
Pumpkins	...	...	...	...	...	...	ton	£4 15s. to £5 15s.
Eggs	...	...	...	...	...	...	doz.	11d. to 1s. 1d.
Fowls	...	...	...	...	...	...	pair	3s. 6d. to 5s. 6d.
Ducks, English	...	...	...	...	...	...	"	2s. 6d. to 4s.
Ducks, Muscovy	...	...	...	...	...	...	"	4s. to 5s.
Geese	...	...	...	...	...	...	"	6s. to 7s.
Turkeys (Hens)	...	...	...	...	...	...	"	6s. 10d. to 7s. 6d.
Turkeys (Gobblers)	...	...	...	...	...	...	"	12s. to 15s.
Wheat	...	...	...	...	...	...	bush.	8s. 2d.

VEGETABLES.

Cabbages, per dozen	...	...	...	...	...	...	1s. to 3s. 6d.
Cauliflowers, per dozen	...	...	...	...	...	...	2s. to 7s. 6d.
Beans, per sugar bag	...	...	...	...	...	...	1s. 6d. to 3s. 6d.
Beetroot, per dozen bunches	...	...	...	...	...	...	6d. to 9d.
Carrots, per dozen bunches	...	...	...	...	...	...	9d. to 1s.
Chocos, per quarter-case	...	...	...	...	...	...	1s. 9d. to 2s. 6d.
Cucumbers, per dozen	...	...	...	...	...	...	...
Custard Marrows, per dozen	...	...	...	...	...	...	1s. 6d. to 4s. 6d.
Vegetable Marrows, per dozen	...	...	...	...	...	...	1s. 6d. to 4s. 6d.
Lettuce, per dozen	...	...	...	...	...	...	...
Peas, per sugar bag	...	...	...	...	...	...	1s. 9d. to 3s. 6d.
Celery, per dozen bunches	...	...	...	...	...	...	1s. 3d. to 1s. 6d.
Sweet Potatoes, per cwt.	...	...	...	...	...	...	4s.
Table Pumpkins, per cwt.	...	...	...	...	...	...	5s.
Tomatoes, per quarter-case	...	...	...	...	...	...	3s. to 6s. 9d.
Turnips, per dozen bunches	...	...	...	...	...	...	6d. to 9d.
Rhubarb, per bundle	...	...	...	...	...	...	1s. to 1s. 6d.

SOUTHERN FRUIT MARKETS.

Article.						AUGUST.
						Prices.
Bananas (Queensland), per case ...	...	...	...	...	...	14s. to 18s.
Bananas (Fiji), per case ...	...	...	...	...	...	23s.
Bananas (G.M.), per case ...	...	...	...	...	...	22s. 6d. to 23s.
Mandarins, per case ...	...	...	...	...	...	3s. to 7s.
Oranges (Navel), per case ...	...	...	...	...	...	4s. 6d. to 6s.
Oranges (other), per case ..	...	...	...	...	...	3s. to 5s.
Passion Fruit, per quarter-case ...	...	...	...	...	...	2s. to 9s. 6d.
Lemons, per bushel case ...	...	...	...	...	...	3s. to 5s. 6d.
Papaw Apples, per half-case ...	...	...	...	...	...	...
Pineapples (Queens), per case ...	...	...	...	...	...	5s. to 8s.
Pineapples (Ripleys), per case ...	...	...	...	...	...	4s. to 4s. 6d.
Pineapples (Common), per case ...	...	...	...	...	...	4s. to 4s. 6d.
Strawberries (Queensland) per tray ...	...	...	...	...	...	3s. to 4s. 6d.
Tomatoes, per quarter-case ...	...	...	...	...	...	3s. to 8s.
Cucumbers, per case ...	...	...	...	...	...	6s. to 8s. 6d.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.						AUGUST.
						Prices.
Apples (Tasmanian), per case ...	...	...	...	...	...	9s. to 10s. 6d.
Apples, Cooking, per case ...	...	...	...	...	...	6s. to 7s. 6d.
Bananas (Cavendish), per dozen ...	...	...	...	...	...	3d. to 4d.
Bananas (Sugar), per dozen ...	...	...	...	...	...	3½d. to 4d.
Cocoanuts, per sack ...	...	...	...	...	...	12s. to 15s.
Custard Apples, per quarter-case ...	...	...	...	...	...	4s. to 5s.
Granadillas, per quarter-case ...	...	...	...	...	...	...
Lemons (Lisbon), per case ...	...	...	...	...	...	4s. to 6s.
Limes (Choice), per quarter-case ...	...	...	...	...	...	2s. to 3s. 6d.
Mandarins, per half-case ...	...	...	...	...	...	2s. to 7s. 6d.
Oranges (Navel), per case ...	...	...	...	...	...	5s. 6d. to 6s. 6d.
Oranges (other), per case ...	...	...	...	...	...	3s. to 3s. 6d.
Papaw Apples, per quarter case ...	...	...	...	...	...	9d. to 2s. 6d.
Passion Fruit, per case ...	...	...	...	...	...	6s. to 9s.
Peanuts, per pound ...	...	...	...	...	...	3d. to 4d.
Rosellas, per sugar bag ...	...	...	...	...	...	...
Pineapples (Ripley), per dozen ...	...	...	...	...	...	1s. 3d. to 3s.
Pineapples (Rough), per dozen ...	...	...	...	...	...	6d. to 1s. 3d.
Pineapples (Smooth), per dozen ...	...	...	...	...	...	2s. 9d. to 3s.
Strawberries, per dozen pint boxes ...	...	...	...	...	...	3s. 6d. to 9s. 3d.
Strawberries, per tray ...	...	...	...	...	...	1s. 6d. to 2s.
Tomatoes, per quarter-case ...	...	...	...	...	...	2s. to 5s. 6d.

TOP PRICES, ENOGGERA YARDS, JULY, 1915.

Animal.	JULY.	
	Prices.	
Bullocks	£19 10s. to £21 12s. 6d.	
Bullocks (single)	£31 10s.	
Cows	£14 5s. to £17 5s.	
Merino Wethers	40s.	
Crossbred Wethers	51s. 3d.	
Merino Ewes	36s.	
Crossbred Ewes	46s. 6d.	
Lambs	40s. 6d.	
Pigs (Porkers)	45s.	

LONDON QUOTATIONS.

London, 1st August.

Danish butter is quoted at 170/ to 174/ per cwt.

The market for frozen rabbits is steady and prices unchanged.

The Liverpool quotation for middling American cotton, August-September shipment, is 5.38d. per lb.

Jute, August shipment, from Calcutta, £23/10/ per ton.

Hemp, August-October shipment, £32.

Copra, South Sea, August-September shipment, £22/5/.

Raw linseed oil, spot pipes, £25 per ton.

Rubber, fine, hard Para, 2/4 $\frac{1}{8}$ per lb.; plantation, first latex crepe, 2/5 $\frac{1}{8}$; smoked sheet, 2/4 $\frac{7}{8}$.

Hemp, sisal. No quotation owing to stoppage of shipments from Mexico. Probable from £38-£40 per ton.

Answers to Correspondents.

THE NUBIAN GOAT.

“ENQUIRER”—

We are informed that the Nubian goat is not at present obtainable in Queensland. You would have to import from Nubia, *viâ* Suakin, on the Red Sea, or Suez.

R. B. PORTER, Calbra.—

See reply to “Enquirer.”

TIMES OF SUNRISE AND SUNSET AT BRISBANE—1915.

(From which those at places west of Brisbane can be reckoned.)

COMPUTED BY D. EGLINTON, F.R.A.S.

Date.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		PHASES OF THE MOON, 1915. On or about the 150th Meridian, East Long. H. M.
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	6·4	5·33	5·30	5·47	4·59	6·4	4·46	6·27	2 Sept. ☾ Last Quarter 12 56 a.m.
2	6·3	5·33	5·29	5·48	4·58	6·4	4·46	6·28	9 " ● New Moon 8 52 p.m.
3	6·2	5·34	5·28	5·48	4·58	6·5	4·46	6·28	16 " ☾ First Quarter 5 21 "
4	6·1	5·34	5·27	5·49	4·57	6·6	4·46	6·29	23 " ○ Full Moon 7 35 "
5	6·0	5·35	5·26	5·49	4·57	6·6	4·46	6·29	The moon will be at its least distance from the earth, roughly about 226,000 miles, on 11th September; and at its greatest distance, about 252,000 miles, on 2nd and 30th September.
6	5·59	5·35	5·25	5·50	4·56	6·7	4·46	6·30	
7	5·58	5·36	5·24	5·50	4·55	6·8	4·46	6·30	
8	5·57	5·36	5·23	5·51	4·54	6·9	4·47	6·31	
9	5·56	5·37	5·22	5·51	4·53	6·10	4·47	6·32	1 Oct. ☾ Last Quarter 7 44 p.m.
10	5·55	5·37	5·21	5·52	4·53	6·11	4·47	6·33	9 " ● New Moon 7 42 a.m.
11	5·53	5·38	5·20	5·52	4·52	6·11	4·47	6·34	15 " ☾ First Quarter 11 51 p.m.
12	5·52	5·38	5·19	5·53	4·51	6·12	4·47	6·35	23 " ○ Full Moon 10 15 a.m.
13	5·50	5·38	5·18	5·53	4·51	6·12	4·48	6·36	31 " ☾ Last Quarter 2 39 p.m.
14	5·49	5·39	5·17	5·54	4·50	6·13	4·48	6·36	The moon will be at its least distance from the earth on 11th October, and at its greatest distance on the 27th.
15	5·48	5·39	5·16	5·54	4·50	6·14	4·48	6·37	
16	5·46	5·40	5·15	5·55	4·49	6·15	4·49	6·38	
17	5·45	5·40	5·14	5·55	4·49	6·16	4·49	6·38	7 Nov. ● New Moon 5 52 p.m.
18	5·44	5·41	5·13	5·56	4·48	6·16	4·50	6·39	14 " ☾ First Quarter 9 3 a.m.
19	5·43	5·41	5·12	5·56	4·48	6·17	4·50	6·39	22 " ○ Full Moon 3 36 "
20	5·42	5·42	5·11	5·57	4·48	6·18	4·51	6·40	30 " ☾ Last Quarter 8 10 "
21	5·41	5·42	5·10	5·57	4·48	6·19	4·51	6·40	The moon will be at its least distance from the earth at midnight on 8th November, and at its greatest distance on the morning of the 24th.
22	5·40	5·43	5·9	5·58	4·47	6·20	4·52	6·41	
23	5·39	5·43	5·8	5·58	4·47	6·21	4·52	6·41	
24	5·37	5·44	5·7	5·59	4·47	6·21	4·53	6·41	7 Dec. ● New Moon 4 3 a.m.
25	5·36	5·44	5·6	5·59	4·47	6·22	4·53	6·42	13 " ☾ First Quarter 9 38 p.m.
26	5·35	5·45	5·5	6·0	4·47	6·23	4·54	6·42	25 " ○ Full Moon 10 52 "
27	5·33	5·45	5·4	6·0	4·47	6·24	4·54	6·42	29 " ☾ Last Quarter 10 59 "
28	5·32	5·46	5·3	6·1	4·47	6·25	4·55	6·43	The moon will be at its least distance from the earth on the morning of 7th December, and at its greatest distance on the morning of the 21st.
29	5·31	5·46	5·2	6·1	4·47	6·26	4·55	6·43	
30	5·30	5·47	5·1	6·2	4·47	6·27	4·56	6·44	
31	...	...	5·0	6·3	...	...	4·56	6·44	

For places west of Brisbane, but nearly on the same parallel of latitude—27½ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun would rise and set about 4 minutes later than at Brisbane if its elevation (1,900 feet) did not counteract the difference in longitude. In this case the times of sunrise and sunset are nearly the same as those for Brisbane.

At St. George, Cunnamulla, Thargomindah, and Oontoo the times of sunrise and sunset will be about 17 m., 28 m., 36 m., and 47 minutes, respectively, later than at Brisbane at this time of the year.

At Roma, on 1st September, the sun will rise about 6·19 and set about 5·51; on 1st October it will rise about 5·46 and set at about 6·4; on 1st November it will rise about 5·18 and set at about 6·20; on 1st December it will rise about 5·7 and set at about 6·41.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed by D. Eglinton, F.R.A.S., and should not be reproduced without acknowledgment.]

Farm and Garden Notes for October.

FIELD.—With the advent of warmer weather and the consequent increase in the soil temperature, weeds will make great headway if not checked; therefore our advice for last month holds good with even greater force for the coming month. Earth up any crops which may require it, and keep the soil loose among them. Sow maize, sorghum, setaria, imphee, prairie grass, panicum, pumpkins, melons, cucumbers, marrows. Plant sweet potatoes, yams, peanuts, arrowroot, turmeric, chicory, and ginger. Coffee plants may be planted out. There are voluminous articles in previous journals giving full instructions how to manage coffee plants, from preparing the ground to harvesting the crop, to which our readers are referred. The planting of the sisal agave and the fourcroya may be proceeded with at any time of the year, but the best time is in spring and beginning of summer, when warm weather and good showers will enable the young plants to root quickly and become firmly established before the winter. The demand for the fibre is constantly increasing, and the supply does not nearly overtake the demand; hence prices keep high, and the outlook for the future is very promising. See our instructions in "The Sisal Industry in Queensland," obtainable free by intending planters on application to the Under Secretary, Department of Agriculture and Stock. Plant only on dry or well-drained soil. Cotton may still be sown.

KITCHEN GARDEN.—Our notes for this month will not vary much from those for September. Sowings may be made of all kinds of vegetables. We would not, however, advise the sowing of cauliflowers, as the hot season fast approaching will have a bad effect on their flowering. French beans, including butter beans, may be sown in all parts of the State. Lima and Madagascar beans should also be sown. Sow the dwarf Lima beans in rows 3 ft. apart with 18 in. between the plants. The kitchen garden should be deeply dug, and the soil reduced to a fine tilth. Give the plants plenty of room, both in sowing and transplanting, otherwise the plants will be drawn and worthless. Thin out melon and cucumber plants. Give plenty of water and mulch tomato plants planted out last month. Asparagus beds will require plentiful watering and a good top-dressing of short manure. See our instructions in "Market Gardening," obtainable on application to the Under Secretary, Department of Agriculture and Stock. Rosella seeds may be sown this month. No farm should be without rosellas. They are easily grown, they bear heavily, they make an excellent preserve, and are infinitely preferable to the mulberry for puddings. The bark supplies a splendid tough fibre for tying up plants. The fruit also makes a delicious wine.

FLOWER GARDEN.—The flower garden will now be showing the result of the care bestowed upon it during the past two months. The principal

work to be done this month is the raking and stirring of the beds, staking, shading, and watering. Annuals may be sown as directed for last month. Plant chrysanthemums, gladiolus and other bulbs, such as tuberose, crinum, ismene, amaryllis, paneratium, hermocallis, hippeastrum, dahlias, &c. Water seedlings well after planting, and shade for a few days. Roses should now be in full bloom. Keep free from aphid, and cut off all spent flowers. Get the lawn-mower out and keep the grass down. Hoe the borders well, and trim the grass edges.

Orchard Notes for October.

THE SOUTHERN COAST DISTRICTS.

As October is often a dry month throughout the greater part of the State, one of the most important duties of the fruit-grower is to keep his orchard or vineyard in a thorough state of cultivation, thus retaining the moisture in the soil that is essential to the setting and development of the fruit crop. As long as the land is level one cannot over-cultivate, as there is no danger of the soil washing, but when the orchard is on a hillside heavy thunderstorms, which may occur during the month, are very apt to cause heavy washaways of soil if the land is kept in the high state of tilth necessary to retain moisture. In this case the cultivation should always be across and not up and down the face of the hill, and where the soil is of such a nature that it will wash badly thin blocks, consisting of a row or two of a growing crop or of light timber, brushwood, or even a body of weeds or heavy mulching, should be provided, such blocks to follow the contour of the orchard. If dry, and water for irrigation is available, citrus trees will be the better for a thorough watering during the month. Give the trees a good soaking, and follow the irrigation by systematic cultivation, as this is much better than constant surface watering, as practised by the Chinese. Examine the orchard and vineyard carefully for pests of all kinds. When young trees are showing signs of scale insects, cyanide same; when leaf-eating insects of any kind are present, spray the plants that are being attacked with arsenate of lead. Look out carefully for black spot and oidium in grape vines, using Bordeaux mixture for the former and sulphur for the latter. When using sulphur, see that you get a fine sample—viz., one in which the particles of sulphur are in a very fine state, as the finer the sulphur the better the results. Do not apply the sulphur in the early morning, but during the heat of the day, as it is the sulphur fumes, not the sulphur, which do the good. A knapsack sulphurer is the best machine for applying sulphur to grape vines, trees, or plants.

Examine any late citrus fruits or early summer fruits for fruit-fly, and take every precaution to keep this great pest in check now, as, if

fought systematically now, it will not do anything like the same amount of damage later on as if neglected and allowed to increase unchecked. October is a good month for planting pineapples and bananas. Be sure and have the land properly prepared prior to planting, especially in the case of pineapples, as the deeper the land is worked and the better the state of tilth to which the surface soil is reduced the better the results, as I am satisfied that few crops will pay better for the extra work involved than pines.

TROPICAL COAST DISTRICTS.

As the fruit-fly usually becomes more numerous at this time of year, especial care must be taken to examine the fruit thoroughly prior to shipment, and to cull out all fruit that has been attacked by the fly. Banana and pineapple plants may be set out, and the orchards should be kept well tilled, so as to have the land clean and in good order before the heavy summer growth takes place.

All the spring crops of citrus fruits should be now marketed, and the trees, where necessary, should be pruned and sprayed, and the land be well ploughed. The ploughing should be followed by harrowing and cultivating, so as to get the surface of the land in good order. Gracillas and papaws should be shipped to the Southern markets, as, if care is taken in packing and they are sent in the cool chamber, they will carry in good order. These fruits should not be gathered in an immature condition, as, if so, they will never ripen up properly. They should be fully developed but not soft, and if gathered in this condition, carefully handled, and packed and shipped in cool storage, they will reach the Southern markets in good condition, and, once they become commonly known, will meet with a ready sale.

SOUTHERN AND CENTRAL TABLELANDS.

In the Stanthorpe district the spraying of apple, pear, and quince trees for codling moth will have to be carefully carried out, the best spray being arsenate of lead, of which there are several reliable brands on the market.

When fungus diseases, such as powdery mildew, &c., are also present, Bordeaux mixture should be combined with the arsenical spray.

The vineyard will require considerable attention, as the vines must be carefully disbudded, and any signs of oidium or black spot should be checked at once. Look out for late spring frosts, and, if possible, try the effect of smudge fires producing dense smoke for preventing any damage.

Keep the orchards and vineyards well cultivated, as it is of the utmost importance to keep the moisture in the soil at this time of the year if a good fruit crop is to be secured.

In the warmer districts cultivation is all-important, and when irrigation is available it should be used for both fruit trees and vines, a thorough soaking followed by systematic cultivation being given.

LIST OF AGRICULTURAL, HORTICULTURAL, AND PASTORAL SOCIETIES AND ASSOCIATIONS IN QUEENSLAND.

Societies and associations desirous of being registered and placed on the above list must make application to that effect, and forward to the Under Secretary for Agriculture and Stock the following particulars:—

Number of members who have paid their subscriptions for 1912.

Number of meetings held by the Society during 1912.

Date of the last meeting.

Name of the Secretary for 1913.

It is equally necessary that prompt notice be given to the Editor of changes in the Secretaryship of any Society or Association, a matter which is much neglected. Furthermore, information concerning dates on which shows are to be held must be forwarded to the Editor at least six weeks before the Show date. If these suggestions are not complied with, the Society whose Secretary neglects to supply the required information will be liable to be struck off the list of Societies published monthly in the Journal.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1914.	1915.
Allora ...	Central Downs Agricultural and Horticultural Association	J. C. Marshall ...	17 and 18 Feb.	17 and 18 Feb.
Aloomba, <i>via</i> Cairns	Aloomba Farmers' Association ...	Hugh A. Niven ...		
Amberley ...	Amberley Farmers' Progress Association	J. T. Goldsborough		
Atherton ...	Atherton Agricultural, Pastoral, and Industrial Association	H. McKnight ...		
Atherton ...	Atherton Table Land Agricultural Society	H. McKnight ...	...	22 and 23 Sept.
Ayr ...	Lower Burdekin Farmers' Association	R. W. Edwards ...		
Ayr ...	Lower Burdekin Pastoral, Agricultural, and Industrial Association	C. G. M. Boyce ...	11 and 12 June	
Bajool ...	Bajool and Ulam Farmers' Progress Association	A. T. Mitchell ...		
Ban Ban, <i>via</i> Byrnestown	Dundar Branch of the Queensland Farmers' Union	Geo. Gwynne ...		
Barcaldine ...	Barcaldine Pastoral Agricultural and Horticultural Association	W. J. P. Chambers		
Beaudesert ...	Logan and Albert Agricultural and Pastoral Society	M. Selwyn Smith	12 and 13 May	11 and 12 May
Beenleigh ...	Agricultural and Pastoral Society of Southern Queensland	Capt. C. G. Gehrman	3 and 4 Sept.	23 and 24 Sept.
Beenleigh ...	Logan Farmers' and Industrial Association	Wm. G. Winnett ...		
Beerwah ...	Coochin Creek District Agricultural and Progress Association	E. F. Jones ...		
Belli ...	Belli Creek Farmers' Progress Association	W. E. Neumann ...		
Berwen ...	Haughton River Farmers' Association	James Griffith ...		
Biggenden ...	Biggenden Agricultural and Pastoral Society	C. J. Stephensen ...	9 and 10 July	22 and 23 June
Bin Bin, <i>via</i> Gooroolba	Bin Bin Farmers and Settlers' Association	Milo Burke ...		
Blackall ...	Barcoo Pastoral Society ...	C. M. Pegler ...		
Blenheim ...	Blenheim and District and Farmers' Progress Association	W. A. Zerner ...		
Blythedale ...	Blythedale Agricultural Progress Association	J. L. Quinn ...		
Boonah ...	Fassifern and Dugandan Agricultural and Pastoral Association	J. McKenzie ...	20 and 21 May	19, 20, and 21 May
Boowoogum...	Brooyar Farmers' Progress Association	Jas. Cahill ...		
Bowen ...	Bowen Farmers' Association...	H. Reye ...		
Bowen ...	Bowen Pastoral, Agricultural and Mining Association	F. Sellars ...	22, 23, and 24 July	

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1914.	1915.
Brisbane ...	The Queensland Dairy Herd Book Society	Alfred Gorrie ...		
Brisbane ...	National Agricultural and Industrial Association of Queensland	J. Bain ...	10 to 15 Aug.	9 to 14 Aug.
Brisbane ...	Queensland Chamber of Agricultural Societies	J. Bain ...		
Brisbane ...	Horticultural Society of Queensland	F. W. Woodroffe ...		
Bucca, <i>vid</i> Bundaberg	United Farmers' Association ...	J. H. Hendy ...		
Buderim Mountain	Buderim Branch of the Queensland Farmers' Union	Capt. G. Burrows ..		
Bundaberg ...	Bundaberg Agricultural, Pastoral, and Industrial Society	Redmond Bros. ...	3 and 4 Sept.	9 and 10 Sept.
Bundaberg ...	Canegrowers' Union of Australia (Woongarra Branch)	O. H. Klotz ...		
Bundaberg ...	Woongarra Canegrowers' Association (A.S.P.A. Branch)	G. O. Strathdee ...		
Bunerba, Deeford (<i>vid</i> Westwood)	Bunerba Farmers' Progress Association	H. J. Barnes ...		
*Burrum ...	Burrum District Farmers' and Fruit-growers' Association	S. E. Tooth ...		
Byrnestown...	Byrnestown Farmers and Dairy-men's Progress Association	Geo. H. Bomford ...		
Caboolture ...	Caboolture Pastoral, Agricultural, and Industrial Society	C. V. Hemming ...	1 May	29 and 30 April
Cairns ...	Cairns Agricultural, Pastoral, and Mining Association	H. McMahon ...		
Cairns ...	Cairns Horticultural Society ..	R. Tweedie ...		
Cedar Pocket, Gympie	Cedar Pocket Farmers' Association...	W. A. Fraser ...		
Charleville ...	Central Warrego Pastoral and Agricultural Association	T. C. Fallis ...	4 and 5 May	
Charters Towers	Charters Towers Pastoral, Agricultural, and Mining Association	A. H. Pritchard ...	1 and 2 July	6 to 8 July
Charters Towers	The Towers Horticultural Society ...	Jas. H. Chappel ...	19 and 20 August	25 and 26 August
Chatsworth...	Chatsworth Combined Farmers' Association	F. W. Johns ...		
Chatsworth...	Chatsworth Farmers' Progress Association	W. Allen ...		
Childers ...	Childers Pastoral, Agricultural, and Industrial Society	J. R. Wrench ...	18 and 19 June	10 and 11 June
Childers ...	Doolbi Canegrowers' Association ...	R. S. Rankin ...		
Chinchilla ...	Canaga Farmers' Progress Association	G. H. Rochester		
Chinchilla ...	Pelican Farmers and Settlers' Association	H. K. Nevell ...		
Chinchilla ...	Chinchilla Agricultural and Pastoral Association	B. Mackie ...	14 and 15 April	6 and 7 April
Clermont ...	Peak Downs Pastoral, Agricultural, and Horticultural Society	A. S. Narracott ...	23 and 24 June	
Clifton ...	Darling Downs Pastoral, Agricultural, and Industrial Association	S. C. Mott ...	30 Sept. and 1 Oct.	22 and 23 Sept.
Coochin ...	Coochin Farmers' Progress Association	W. Watson ...		
Cooktown ...	Cooktown District Pastoral, Agricultural, Mining, and Industrial Association	E. A. S. Olive ...	1 and 2 July	
Cooroy ...	Cooroy West Farmers' Progress Association	O. M. Proll ...		
Cooroy ...	Mount Cooroy Progress and Farmers' Association	L. H. Baldwin ...		
Coulsen ...	Coulsen Farmers' Progress Association	Gustav A. Lewald		
Coulstoun, <i>vid</i> Biggenden	Coulston Lakes Branch of the Queensland Farmers' Union	P. E. Britnell ...		
Crow's Nest	Crow's Nest Agricultural, Horticultural, and Industrial Society	James Gleeson ...	28 and 29 April	6 and 7 April
Dalby ...	Northern Downs Pastoral and Agricultural Association	W. R. Hunter ...	26 and 27 May	21 and 22 April

* Monthly meetings held alternately at Burrum and Howard.

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1914.	1915.
Dallarnil ...	Dallarnil Farmers and Dairymen's Associat	H. J. Piper ...		
Didcot ...	Didcot Farmers and Settlers' Association	Fred. Jones ...		
Deeford, (Dawson Valley)	Dundee Farmers and Settlers' Progress Association	C. G. Young ...		
Degilbo ...	Emu Creek Farmers and Dairymen's Progress Association	J. E. Peterson ...		
Dirran, <i>via</i> Malanda	Dirran Settlers' Progress Association	Percy G. R. Dutton		
Emerald ...	Emerald Pastoral and Agricultural Society	J. Esmond ...	...	26 and 27 May
Esk ...	Esk and Toogoolawah Pastoral, Agricultural, and Industrial Association	Thos. C. Pryde ...	5 and 6 May (a Toogoolawah)	8 and 9 June
Eukey, <i>via</i> Ballandean	Eukey Farmers and Fruit-growers' Association	H. H. Stanton ...		
Evelyn ...	Millstream Farmers and Settlers' Association	H. R. Gardiner ...		
Fairford ...	Fairford Agricultural and Pastoral Association	H. E. Hollins ...		
Fordsdale, <i>via</i> Grantham	Fordsdale Farmers' Association ...	W. M. Ridley ...		
Forest Hill ...	Forest Hill Agricultural and Progress Association	J. Stoddart ...		
Gayndah ...	Pastoral, Industrial, Agricultural, and Horticultural Association	M. C. Stephensen...	9 and 10 June	22 and 23 June
Gayndah ...	Gleneden Branch of the Queensland Farmers' Union	W. S. Morris ...		
Gayndah ...	Gurgeena Farmers' Progress Association	W. G. Leaver ...		
Gayndah ...	Binjour Farmers' Progressive Association	F. G. Hunter ...		
Gin Gin ...	Currajong and Gin Gin Agricultural, Pastoral, and Industrial Society	C. M. Morris ...	27 and 28 May	17 and 18 June
Gladstone ...	Port Curtis Agricultural, Pastoral, and Mining Association	Ploughing Match J. T. W. Brown ...	...	18 and 19 May
Glen Aplin ...	Ballandean Fruitgrowers' Association	W. H. C. Laird ...		
Gooburru ...	Gooburru Farmers' and Cane-growers' Association	W. J. Lutin ...		
Goomboorian road <i>via</i> Gympie)	Ross and Mullin's Creek Farmers' Progress Association	R. E. Kitchen ...		
Goombungee	Goombungee Agricultural, Horticultural and Pastoral Society	J. J. Morgan ...	...	24 March
Goondiwindi	Comoron-Moorobie Farmers' Progress Association	J. Johnston ...		
Goondiwindi	MacIntyre Pastoral and Agricultural Society	E. T. Drake ...	29 and 30 April	
Gooroolba ..	Gooroolba Farmers and Settlers' Progress Association	H. A. Harrison ...		
Grantham ...	Ma Ma Creek Farmers' Progress Association	A. McKenzie ...		
Gympie ...	Agricultural, Mining, and Pastoral Society	F. W. Shepherd ...	9 and 10 Sept.	1 and 2 Sept.
Gympie (Goomboorian road)	The Veteran and Scrubby Creek Farmers' Progress Association	T. T. Ramskill ...		
Hambledon (Cairns)	Hambledon Cane Farmers' Association	F. C. P. Curlewis		
Hawthorn (Daymar Siding)	Weengallon Farmers and Settlers' Progress Association	Laurence A. Seeger		
Helidon ...	Flagstone Creek Branch of the Queensland Farmers' Union	Fred Tuffrey ...		
Herberton ...	Herberton Mining, Pastoral, and Agricultural Association	Richard Barton ...	13 and 14 April	5 and April
Hughenden...	North Western Queensland Pastoral and Agricultural Association	H. P. Blackall ...	11 and 12 May	

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1914.	1915.
Ingham ...	Herbert River Pastoral and Agricultural Association	R. L. Jones ...	4 and 5 Sept.	17 and 18 Sept.
Inglewood ...	Inglewood Agricultural, Pastoral, and Horticultural Society	J. F. Cheshire ...	19 and 20 March	24 and 25 March
Inkerman (Lower Burdekin)	Inkerman Farmers and Graziers' Association	L. M. Osborne ...		
Innisfail ...	Johnstone River Canegrowers and Manufacturers' Association	Ralph Reid ...		
Innisfail ...	Johnstone River Agricultural Society	T. Nesbet ...		
Ipswich ...	The Queensland Pastoral and Agricultural Society	G. W. Allen ...	27 and 28 May	26 and 27 May
Ipswich ...	Ipswich Horticultural Society	Hugh Parkinson ...		
Jackson (Western Line)	Parish Woleebee Settlers' Association	S. C. Griffin ...		
Jardine ...	Jardine Farmers' and Fruitgrowers' Association	H. M. Scheibe ...		
Juandah ...	Juandah Dairy and Progress Association	R. Bowie ...		
Kamma (Cairns)	The Cairns Canegrowers' Association	C. V. Hives ...		
Kenmore ...	Brookfield, Pullen Vale, and Moggill Farmers' Association	F. B. Howard ...		
Kilcoy ...	Kilcoy Pastoral, Agricultural, and Industrial Society	W. E. Reason ...	14 and 15 May	6 and 7 May
Kilkivan ...	Kilkivan Pastoral, Agricultural, and Industrial Association	F. E. Hopkins ...	2 July	9 and 10 June
Killarney ...	Killarney Agricultural Society	L. W. Wilkinson ...	...	24 and 25 Feb.
Kingaroy ...	Agricultural, Pastoral, and Industrial Society	R. A. Pearce ...	20 and 21 May	24 and 25 March
Kin Kin, <i>via</i> Cooran	Kin Kin and District Farmers' Progressive Association	A. C. Stewart ...		
Kooroongarra, <i>via</i> Inglewood	Kooroongarra Farmers' Progress Association	J. French ...		
Laidley ...	Farmers' Progress Association	G. A. Moulday ...		
Laidley ...	Lockyer Agricultural and Industrial Society	F. Roberts ...	...	21 and 22 July
Lake Clarendon (<i>via</i> Gatton)	Lake Clarendon Branch of the Queensland Farmers' Union	W. J. Walton ...		
Lockrose ..	Lockrose and District Farmers' Progress Association	R. W. L. Rayment		
Longreach ...	Longreach Pastoral and Agricultural Society	A. Petersen ...	4 and 5 May	
Lowood ...	Lowood and Tarampa Pastoral and Agricultural Association	W. E. Michel ...	13 and 14 May	11 and 12 May
Mackay ...	Pioneer River Farmers and Graziers' Association	T. J. Leonard ...	23 and 24 June	
Mackay ..	The Pioneer River Farmers and Graziers' Show Association	T. J. Leonard ...	...	22 and 23 June
Macnade, <i>via</i> Lucinda	Macnade Farmers' Association	E. S. Waller ...		
Malanda ...	Millaa Millaa Settlers' Progress Association	S. S. Buckley ...		
Mapleton ...	Mapleton Fruitgrowers and Farmers' Progress Association	J. G. Smith ...		
Marburg ...	Marburg and District Agricultural and Industrial Association	A. H. Bielefeld ...	2 and 3 June	2 and 3 June
Mareeba ...	Mareeba District Mining, Pastoral, Agricultural, and Industrial Association	W. A. Ferguson ...	25 and 26 May	
Maryborough	Wide Bay and Burnett Pastoral and Agricultural Society	H. A. Jones ...	2, 3, and 4 June	1, 2, and 3 June
Miles ...	Miles District Agricultural and Pastoral Society	T. P. Goonan ...	...	21 April

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1914.	1915.
Minehan's Siding, <i>via</i> Townsville	Haughton River Farmers' Association	W. E. G. Smith ...		
Mitchell ...	Maranoa Pastoral, Agricultural, and Industrial Association	Neil Hammond ...	12 and 13 M	11 and 12 May
Mondure, <i>via</i> Wondai	Mondure Farmers and Dairymen's Association	G. E. Compagnoni		
Montville ...	Montville Fruitgrowers and Farmers' Progress Association	F. W. Thompson ...		
Mooloolah ...	Mooloolah and Glenview Farmers' Progress Association	William Ellison ...		
Mount Gravatt	Mount Gravatt and District Agricultural, Horticultural, and Industrial Society	J. H. Rackley ...		23 Oct.
Mount Larcom (Gladstone)	Wilmott Farmers' Progress Association	J. J. Kelly ...		
Mount Larcom	Mount Larcom Farmers' and Cane-growers' Association	Thomas Fraser ...		
Mt. Marshall, <i>via</i> Allora	Mount Marshall Farmers' Progress Association	J. Rooney ...		
Mullet Creek	Mullet Creek Farmers' Association ..	G. Lee ...		
Mundowran	Mundowran Pocket Farmers' Association	E. Canty ...		
Mundubbera	Mundubbera Farmers and Settlers' Progress Association	W. G. Parker ...		
Murgon ...	Murgon Branch of the Queensland Farmers' Union	W. D. Davidson ...		
Murray's Creek	Murray and Baffle Creek Progress and Farmers' Association	T. J. Gee ...		
Nambour ...	Maroochy Pastoral, Agricultural, Horticultural, and Industrial Society	A. H. Bushnell ...	8 and 9 July	21 and 22 July
Nambour ...	Bli Bli Farmers and Fruitgrowers' Progress Association	F. Pashen ...		
Nanango ...	Nanango Agricultural, Pastoral, and Mining Society	W. Selby ...	27 and 28 May	*
Nerang ...	Southern Queensland and Border Agricultural and Pastoral Association	Edgar J. Foote ...		
North Arm, N. C. Railway	North Arm Farmers' Progress Association	J. F. Fountain ...		
North Pine ...	The Pine Rivers Agricultural, Horticultural, and Industrial Association	G. W. Armstrong...	25 and 26 June	25 and 26 June
Oakey ...	Oakey Agricultural and Pastoral Society	Alan B. Stanley ...	9 Sept.	
Oakey Creek, <i>via</i> Eumundi	Kenilworth Farmers' Association ...	Harry Pickering ...		
Okeden, <i>via</i> Wondai	Proston, Okeden, and Wigtoun Settlers' Association	R. McNamara ...		
Oman-ama ...	Redbank Farmers' Progress Association	W. K. Ison ...		
Palmwoods ...	Queensland Farmers' Union (Palmwoods Branch)	W. Browne ...		
Palmwoods ...	Palmwoods Progress and Fruit-growers' Association	Hugh McKay		
Philpott ...	Philpott Creek Farmers' Progress Association	E. P. Earle ...		
Pickanjenie	Pickanjenie Farmers' Progress Association	J. Proud ...		
Pittsworth ...	Pittsworth Pastoral, Agricultural, and Horticultural Association	W. O. Hare ...	28 Jan.	27 Jan.
Pomona ...	Noosa Agricultural, Horticultural, and Industrial Society	A. H. Shears ...	4 and 5 Nov.	17 and 18 Nov.
Proserpine ...	Proserpine Farmers and Cane-growers' Association	W. B. Caswell ...	17 July	
Ravenshoe ...	Ravenshoe Farmers and Graziers' Progress Association	W. R. Soilleux ...		
Roche Creek, <i>via</i> Miles	Roche Creek Farmers' Progress Association	G. F. Smith ...		
Rockhampton	Alton Downs Farmers' Association...	G. T. Crook ...		

* Show abandoned

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1914.	1915.
Rockhampton	Rockhampton Agricultural Society...	H. Hill	18, 19, and 20 June	27, 28, and 29 May
Rockhampton	Jardine Farmers and Fruitgrowers' Progress Association	R. Lamain		
Rockhampton	Fitzroy Farmers' Progress Association	T. Ritchie		
Roma ...	Western Pastoral and Agricultural Association of Queensland	H. M. Campbell ...	19 and 20 May	20 and 21 July
Roma ...	Euthulla and Upper Bungil Farmers and Settlers' Association	John J. Maun		
Rosewood ...	Rosewood Agricultural and Horticultural Association	A. J. Loveday	29 and 30 July	28 and 29 July
Sexton ...	Sexton Farmers and Settlers' Progress Association	W. K. Harvey		
Speedwell, <i>via</i> Stalworth	Speedwell Farmers' Progress Association	Aubray U. Potter		
Springsure ...	Springsure Pastoral and Agricultural Society	W. Fisher	13 and 14 May	12 and 13 May
St. George ...	Balonne Pastoral and Agricultural Association	Mark Roberts		
Stanthorpe ...	Stanthorpe Agricultural Society ...	A. E. Bateman ... ..	...	2, 3, and 4 Feb., 1916
Tabragalba ...	Tabragalba and Canungra Farmers' Progress Association	A. R. Ludwig		
Takura, <i>via</i> Maryboro'	Takura Farmers' Union	S. E. Tooth		
Teutoberg ...	Teutoberg Farmers' Progress Association	E. H. Ochmichen ...		
The Caves, <i>via</i> Rockhampton	Mount Etna Farmers and Selectors' Progress Association	Geo. Smith		
The Gums, <i>via</i> Tara	The Gums and Horse Creek Pastoral and Agricultural Association	S. E. Love		
Tolga ...	Tolga Forest Farmers' Union ...	H. Northey		1915.
Toowoomba...	Royal Agricultural Society of Queensland	G. Noble	21 to 23 April	13, 14, and 15 April
Toowoomba...	Toowoomba White Growers' Association	A. C. Salmon		
Townsville ...	Townsville Pastoral, Agricultural, and Industrial Association	J. N. Parkes	14 and 15 July	29 and 30 June
Wallumbilla	Wallumbilla Farmers' Association ...	H. A. Watson		
Warwick ...	Eastern Downs Horticultural and Agricultural Association	F. H. Selke	10 to 12 Feb.	9, 10, 11, & 12 Feb.
Wellington Point	Wellington Point Agricultural, Horticultural, and Industrial Association	E. Ziegenfusz	4 July	
Wondai ...	Wondai Agricultural, Pastoral, and Industrial Society	H. J. Compagnoni	13 and 14 May	26 and 27 May
Wondalli, <i>via</i> Goondiwindi	Wondalli-Yelarbon Farmers' Progress Association	L. C. G. Cameron		
Woodend ...	Warren-Woodend Farmers' Club ...	W. Lehfeld		
Woodford ...	Woodford Agricultural, Pastoral, and Industrial Society	G. H. Osmond	28 and 29 May	22 and 23 April
Woombye ...	North Coast Agricultural and Horticultural Society	E. E. McNall	10 and 11 June	23 and 24 June
Woombye ...	Woombye Fruitgrowers' and Progress Association	J. Howe		
Woongarra ...	Woongarra Canegrowers and Farmers' Union	H. A. Cattermull...		
Weowoonga Scrub	Woowoonga Farmers and Canegrowers' Association	Thos. Wilkins		
Yandina ...	Maroochy River Farmers' Union and Progress Association	D. G. Martin		
Yandina Creek <i>via</i> North Arm, N.C. Line	Yandina Creek Farmers and Settlers' Progress Association	J. D. Benfer		
Yingerbay ...	Yingerbay Dairymen and Farmers' Association	R. Frederick		
Zillmere ...	Zillmere Agricultural, Horticultural, and Industrial Society	Arthur B. Marquis	3 Oct.	18 Sept.

Departmental Announcements.

The Editor will be glad to receive any papers of special merit which may be read at meetings of Agricultural and Pastoral Associations in Queensland, reserving, however, the right to decide whether their value and importance will justify their publication.

Secretaries of Associations are requested to be good enough to forward to the Editor, as early as possible, the dates of forthcoming Shows, as it is important in the interests of the Associations that these dates should be published.

It is equally necessary that prompt notice be given to the Editor of changes in the Secretaryship of any Society or Association, a matter which is much neglected. Furthermore, information concerning dates on which shows are to be held must be forwarded to the Editor at least six weeks before the Show date. If these suggestions are not complied with, the Society whose Secretary neglects to supply the required information will be liable to be struck off the list of Societies published monthly in the Journal.

To enable recipients of the *Queensland Agricultural Journal* to have the half-yearly volume bound, Covers in Boards and Cloth will be supplied from this Office on application to the Under Secretary for Agriculture. Applications must be accompanied by a remittance to cover cost. Covers will be supplied at ONE SHILLING and ONE SHILLING AND NINEPENCE each.

In order to avoid disappointment, correspondents who wish for replies to questions in the Journal are requested to note that it is imperative that all matter for publication on the first day of any month should reach the Editor by the 15th of the previous month.

Persons desiring to communicate with the Queensland Agricultural College and State Farms are requested to address their correspondence to the Principal of the College, Gatton, and to the Managers of the State Farms. The State Farms are: Hermitage (Warwick), Gindie (*viâ* Springsure), Warren (Stanwell), Bungeworgorai (Roma), Kairi (Tolga), Kamerunga State Nursery (Cairns).

We would ask our Subscribers to note that, when their Subscription has run out, a RED CROSS is placed against the Order Form. It often happens that this intimation is disregarded, with the result that the JOURNAL is NOT POSTED to the Subscriber. The Department cannot guarantee to supply back numbers in such cases.

It is notified, for the information of intending Visitors to the Queensland Agricultural College, that the Second Wednesday in each month has been set apart for the reception of Parties of Farmers and others desirous of inspecting the Institution. Supplies of hot water and milk can be obtained at the College, if desired.

The Department has now prepared a booklet on "Flower Gardening for Amateurs," which may be obtained on application to the Under Secretary for Agriculture and Stock. Price, TWO SHILLINGS.

PAMPHLETS on different subjects relating to Agriculture, Horticulture, and Stock are issued by the Department, and may be obtained gratis, on application to the Under Secretary.

NOTICE OF SHOW DATES.

We wish to draw the attention of Secretaries of Agricultural and Pastoral Societies and Associations to the importance of promptly notifying the Editor of any change in the dates on which shows are to be held.

QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

FOR SALE.

GRASS ROOTS.—Paspalum and Rhodes Grass at 2s. 6d. per sack, f.o.b., Gatton. JAPANESE MILLET SEED.—Price, 3d. per lb., or 25s. per cwt., f.o.b., Gatton.

Applicants will be supplied on receipt of remittance to the amount of the Order. There are no other Farm Seeds or Produce at present for Sale at the College.

POULTRY DEPARTMENT.

The College has for sale Poultry of the following breeds:—Brown Leghorn, White Leghorn, Silver-Grey Dorking, Indian Game, Plymouth Rock, Black Orpington, Buff Orpington, Silver-Laced Wyandotte, and White Wyandotte.

PRICES.

Cockerels, 10s., 15s., and 21s., f.o.b., Gatton.

Pairs—Cockerel and Pullet—30s. and 42s., f.o.b., Gatton.

Trios—Cockerel and Two Pullets—42s. and 63s., f.o.b., Gatton.

Prices vary, as above stated, according to quality. Additional charges of 2s. for a single bird and 1s. for each additional bird will be incurred by purchasers who fail to return crates promptly.

Eggs of the above breeds are offered for sale during the season, 1st July to 30th November. Price, 10s. per setting of twelve, f.o.b., Gatton. Nine eggs in each setting are guaranteed fertile. Should less than nine prove to be fertile, the infertiles will be replaced, if returned, carriage paid, and unbroken.

(N.B.—An infertile egg is uniformly translucent when held up to a strong light. Settings should be allowed to settle 24 hours before being placed under the hen.)

In cases where eggs cannot be sent otherwise than by parcel post, sixteen eggs will be sent to a setting, and no responsibility will be taken in connection with the replacing of any eggs which fail to hatch.

Applications for birds or eggs should be accompanied by remittance and addressed to the Principal, Agricultural College, Gatton.

The following Stud Animals are available for Service at the College Farm:—

AYRSHIRE—

Netherton King George, Imported. Sire: Netherton King Arthur. Dam: Midland Young Greenfield.

SHORTHORN BULL—

Bloomer of Darbalara. Sire: Emblem of Darbalara, 100 M.S.H.B. Dam: Lucy II., 1038 M.S.H.B.

Sows may be served also by imported Berkshire, British Large Black, and Yorkshire Pigs, at a charge of 5s. for each service.

Consequent on the numerous orders on hand for Pigs for forward delivery, it will be several months before there is any likelihood of fresh orders being filled.

A charge of **Two Shillings and Sixpence** will be made if Sows are left at the College for three weeks, for second service if required, for the keep of each animal.

Orders will be accepted after the 1st January, 1915, for **Berkshire and Yorkshire Boars**. It will, however, be some months before orders for Sows of either breed can be booked.

J. BROWN, Principal.

QUEENSLAND AGRICULTURAL COLLEGE.

The College, which is situated within 4 miles of Gatton and 1 mile from the College Railway Siding, comprises 1,692 acres, and the buildings can accommodate 60 Students.

TERMS.

Twenty-seven Pounds per annum, paid half-yearly in advance. Students are also charged **One Pound** per annum each for medical attendance, the sports fund, and for guarantee fee.

The course of instruction includes **Practical Agriculture** in all its branches, **Dairying, Gardening, Stock-Breeding, and Mechanical Arts.** Classes are also held daily for **Theoretical Instruction** in these branches, as well as in **Surveying, Chemistry, &c.**

The College Calendar, giving full particulars, may be obtained on application to the Principal at the College, or to the Under Secretary for Agriculture and Stock, Brisbane.

BURSARIES.

Four bursaries are given annually. An examination for these is held in December of each year. Bursaries will be awarded upon the following conditions:—Candidates (males) to be from fifteen to eighteen years of age, of sound constitution, and in good health; they must have resided in the State for the two years immediately preceding the time of their examination for such bursary; or their parents must have resided in the State three years immediately preceding such examination. The bursar is entitled—subject to good behaviour and the pleasure of Parliament—to free board and instruction as a resident student for a period of three years. He is required to take up his residence at the College within one month of the publication of the results of the examination; otherwise he forfeits his right to a bursary.

The **Age of Candidates** for Admission to the College as Students is **Fourteen Years.**

Full particulars and conditions on application to

The Under Secretary,
Department of Agriculture and Stock, Brisbane.

STATE FARM - - WARREN.

Stock for Sale.

YOUNG AYRSHIRE BULLS. Prices and particulars on application. **Young BERKSHIRE BOARS and SOWS.** Prices: Boars, £2 2s.; Sows, £1 1s. F.O.B., Warren. Crates returned.

Roots of the following Grasses for sale at 2s. 6d. per sack. F.O.B., Warren:—**Rhodes, Paspalum, Giant Couch.**

FOR SERVICE.—The Imported **Clydesdale Stallion, "Sir George."** Fee: £2 2s. per mare; and 1s. per week agistment. **Ayrshire Dairy Bull, "Naomi's Arthur."** Fee: 5s. per cow; and 6d. per week agistment. **Two Imported Berkshire Boars—**"Peterkin W." and "Flockmaster." Fee: 5s. per sow; and 1s. per week agistment.

THOS. JONES, Manager.

Department of Agriculture and Stock, Queensland.

“The Fruit Cases Act of 1912.”

Attention is drawn to the Regulations under this Act which come into force on the 1st June, 1915, and it is notified that on and after that date fruit that is sold in cases or is exported to any place within the Commonwealth must be in cases of the dimensions mentioned below. Bananas are excepted from the operations of the Queensland Act.

The sizes of the fruit cases required in New South Wales are of the same dimensions as those in the Queensland Act. The New South Wales Regulations are already in force.

Any case must be of one of the following **inside** measurements, clear of any divisions.

	LENGTH.	DEPTH.	WIDTH.
	inches.	inches.	inches.
(1) 1 bushel	18	$14\frac{1}{4}$	$8\frac{2}{3}$
(2) do.	26	$14\frac{1}{4}$	6
(3) do.	20	10	$11\frac{1}{8}$
(4) $\frac{1}{2}$ bushel	18	$7\frac{1}{8}$	$8\frac{2}{3}$
(5) do.	26	$7\frac{1}{8}$	6
(6) do.	18	$5\frac{1}{4}$	$11\frac{3}{4}$
(7) $\frac{1}{4}$ bushel	$13\frac{3}{4}$	4	$10\frac{1}{8}$
(8) Tropical Fruit Case (for Pineapples, etc.)	$24\frac{3}{4}$	12	12

New or Clean Cases.

1. All cases for the Queensland trade must be new or clean and free from insect or fungus diseases.

2. New cases only must be used for fruit exported to any of the other Australian States.

3. New cases only must be used (under any circumstances) in the fruit districts of Stanthorpe and Bowen.

Case to show Maker's Name, Address, and Guarantee.

Every case, whether the fruit is for sale in Queensland or in another Australian State, must have legibly and durably on one end of the outside of the case:—

1. The name and address of the packer of the case.

2. The words “guaranteed by packer to contain 1 Imperial bushel” or as the size of the case may warrant.

In the case of the Tropical Fruit Case the guarantee should be—
“Guaranteed by maker to contain not less than 3,564 cubic inches.”

The above name, address, and guarantee should be at least 5 inches long and 2 inches wide; but stamps 3 inches by $1\frac{1}{2}$ inches and upwards will be accepted.

Exception.

The Act will not apply to the sale of fruit sold in trays, baskets, casks, or buckets, or to crates which contain trays of fruit. Fruit so packed, however, must have marked on the package the weight or number of its contents.

Contraventions.

Penalties are provided for persons who—

1. Pack fruit for the Queensland trade in disease-affected cases.
2. Export fruit to another Australian State in second-hand cases.
3. Obstruct or refuse to give information to an Inspector who is carrying out the Act.
4. Place an incorrect guarantee on a case.
5. Export fruit in a case carrying an incorrect guarantee.
6. Alter the size of a case bearing the packer's name, address, and guarantee.
7. Interfere with the packer's name, address, or guarantee on the case.

ERNEST G. E. SCRIVEN,

19th April, 1915.

Under Secretary.

ROMA STATE FARM, BUNGEWORGORAI.

SEEDS AVAILABLE.

Teff Grass Seed, 1s. per lb.

Plants—Rhodes Grass.

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FOR SALE.

Orders accepted for JERSEY and AYRSHIRE BULLS as at six months old; BERKSHIRE PIGS as at six weeks old; and BUFF ORPINGTON COCKERELS.

CONDITIONS: Stock to be paid for and delivery taken at the Farm.

Those desirous of obtaining Stock from this Farm should apply to the Manager, from whom all particulars can be obtained,

D. MACPHERSON, *Manager*

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Having 18 years' experience I can supply Vegetable Seeds most suitable for the North in 3d. and 6d. packets.

Orders for 5/- and upwards, Post Free; except Peas and Beans.

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CHARTERS TOWERS.

BLACKLEG VACCINE.

DOUBLE VACCINE (powder form) for the PREVENTION of BLACKLEG is now prepared by the Department of Agriculture and Stock, and may be obtained in Tubes containing not less than Ten Doses, at a cost of 3s. per Ten Double Doses.

Full Instructions for Use are sent with the Vaccine.

Applications for same must be accompanied by Remittance, and addressed to:—

THE GOVERNMENT BACTERIOLOGIST,

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NEAR BRISBANE.

VOL. IV., PART 4.

[Oct., 1915.

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EDITED BY A. J. BOYD F.R.G.S.Q.

NEW SERIES.

VOL. IV. PART 4.

OCTOBER.

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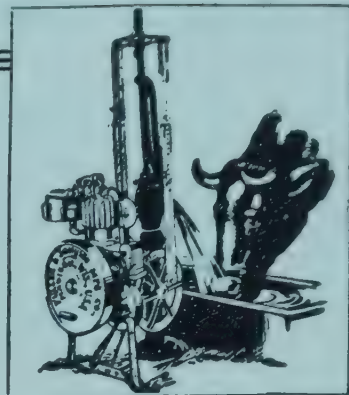
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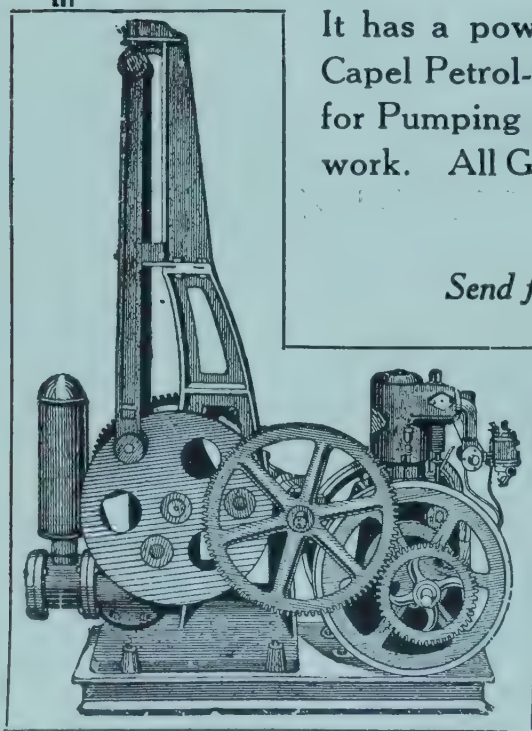
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QUEENSLAND AGRICULTURAL JOURNAL

VOL. IV.

OCTOBER, 1915.

PART 4.

Agriculture.

SOURCES OF PLANT FOOD.

By C. B. WELSH, F.R.H.S., Sunnybank.

Amongst those whose occupation consists in the intensive cultivation of the land, the question is constantly being asked, "How can I retain the complete fertility of the soil?" To those living near town, stable manure was a source of supply; but, with the rapidly increasing motor traffic, stable manure is fast becoming difficult to obtain in sufficient quantities. To the market gardener and fruit-grower it is not in many cases practicable or convenient to keep sufficient stock as a source of manure for his land; but manure the grower must have, or the fertility of his soil will soon be reduced and its cropping ability diminish.

Artificial fertilisers can be used to supply deficient plant foods, but they cannot supply humus, which forms the basis of all successful

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ERNEST WICKHAM, Res. Sec.

manuring. The value of stable and farmyard manures—although they contain all the elements of a plant's nutrition (*viz.*, nitrogen, potash, and phosphoric acid), in more or less available form—consists in the amount of humus they supply to the soil which they help to build up. Humus is not exactly a direct plant food, but it supplies the ideal rooting medium for plant life. By its decay all the constituents of plant food are rendered available and the plant is enabled to make a perfect growth. Humus possesses other available properties which must not be overlooked, for by its decay vegetable acids are formed which are powerful in attacking dormant plant food in the soil, and so bring it into a condition suitable for the plant to absorb.

Generally, peaty soils and fen land contain sufficient humus; but it is of such an acid nature that a good system of drainage must be adopted, and the addition of lime is required to sweeten it.

The physical effects of humus upon the texture and water-holding capacity of the soil are most important, for it has been proved that a soil containing a stock of humus has during a dry spell produced better yields of crops than a soil rich in fertilisers, but deficient in humus. The water-retaining capacity of a soil rich in humus is from three to four times greater than that of a soil devoid of humus.

If we were to treat a sandy soil with plentiful dressings of farmyard manure or organic matter, in time, instead of the soil running through the fingers as through a sieve, it would be moist enough to hold together in a little ball. Just the opposite action takes place when a stock of humus is built up in a heavy clay soil, for, in a short time, the heavy soil becomes porous and friable; it is easier to work, and is also warmer in winter and cooler in summer, or, I should say, a more uniform soil temperature is maintained.

Another good and necessary purpose humus serves is, to encourage life in the soil. A sterile or dead soil will produce nothing; we must have a living soil, for, if a soil is to be fertile, it must contain millions of living workers called "bacteria." These microscopic organisms play a most important part in the nutrition of plants, and much scientific study has been given to their action in the soil.

The chief object sought after in manuring is to increase the supply of food in a form in which it can be used to make inert plant food available, so that plants may produce their maximum yield of crops. Farmyard manure can only be classed as a slow manure, and some of the undigested residues will remain in the soil for a considerable time before they become available as plant food, and, were it not for the valuable humus which it goes to build up in the soil, it is questionable whether it would pay to use it when we consider the extra expensive labour involved in cartage and spreading.

When such crops as cabbage and cauliflower and crops for green feed as oats, barley, maize are being grown, and potash and phosphoric acid not lacking in the soil, I know of no better fertiliser to use than nitrate of soda for quick returns. It is simply marvellous the rapid action it has if applied, at the rate of $\frac{1}{2}$ lb. to 20 square yards, or 1 to

2 cwt. to the acre, to young cabbage just prior to hearting, in and during showery weather, or before the crop is watered by means of irrigation; the cabbage will be ready for market two or three weeks earlier. Care should be taken when sowing nitrate of soda to prevent it lodging on the foliage of the plants, as it is injurious to the leaf tissues.

Nitrate of soda should not be used excessively on heavy soils, as, if repeatedly used year after year, it has a very injurious effect on the tilth of the soil, causing it to become sticky and cloggy in wet weather, and on becoming dry the soil sets hard on the crust. This deleterious action is not so apparent in sandy soils, but in such soils it should be used in small applications, because it must be remembered that nitrate of soda is water soluble and is immediately available for food; therefore, what the growing plant is unable to absorb is washed into the subsoil or drainage water and lost, as it is not retained by the soil.

For vegetable-growing, the soil can hardly be too rich, as the foliage and roots form the edible portion. Flowers obtain their colours from minerals in the soil, and it is a mistake to give excessive dressings of fresh farmyard manure, because it produces a rank growth, superfluity of foliage, and a coarse, loose flower. In flower cultivation, the object of attainment is a flower of substance, size, colour, and keeping qualities. At experiments carried out at the New Hampshire Agricultural Station, U.S.A., it was found in carnation culture that bonemeal gave the best results as regards the vigour and keeping quality of the cut blooms. Fowl manure, which is a rich organic manure, when used in excess, gave poor results and was distinctly harmful. Nitrate of soda was most unsatisfactory; as it produced flowers of poor colour and keeping qualities.

In seed-growing, it is usual to limit supplies of food, as by so doing a better quality of seed is produced. Many farmers have no doubt noticed that when a tree is ring-barked it produces an immense crop of seed just prior to its death; also, orange trees, when roots are attacked by rot, produce fruit containing much seed instead of the juicy and luscious product. If an unproductive apple tree, which has been making a surplus of rank growth, owing to excessively rich manuring, be root-pruned, it produces good crops of fruit. It seems to be one of Nature's laws that, if the supply of plant food is checked, the plant expends its energy in producing seed to supply the next generation of plants.

On the seed farms in England and Holland, noted for their supplies of pure, bright, plump seed, it is the usual practice, after selection, to transplant cabbage, cauliflower, root crops, &c., on to land in a good state of cultivation, but not recently manured, and there remain to produce their crop of seed. The best double stocks are grown in flower pots, the restricted root area promoting a better quality of seed. From these observations and facts, we may deduce that dressings of rich nitrogenous manures produce abundance of growth, which is what is required when the foliage is consumed as food. Well-decomposed manures, potash, and phosphoric acid develop the fruit and seed and a well-balanced growth.

A valuable source of manure to those situated where stable manure cannot be obtained, and stock is not kept, is the growing of green crops and ploughing them in. It is surprising what can be done to enrich poor soil in this manner; providing there is depth and easy cultivation, with a good rainfall, it is only a matter of time, and the soil can be built up and humus supplied, for it naturally follows that, as the very essence of food was taken out of the soil to build up the bodies of the plants which form the humus, they are full of nourishment and will, when decomposed, supply the growing generation of crops with the very properties required.

Suitable crops for green manuring are buckwheat, rape, cowpeas, lupins, vetches; the leguminous crops are the most valuable, because the bacteria which develop nodules upon the roots are able to collect the nitrogen from the atmosphere and store it up in the root nodules. All that is necessary in green manuring is to roll the crop, use a plough with a rolling coulter, attach a chain to the beam of the plough just long enough to reach under the mouldboard; as the plough moves along, the chain guides the green stuff under the mouldboard, and it is nicely covered. It is essential to plough under in wet or moist weather and well bury the crop. After ploughing, it is advisable to roll, as this consolidates the soil and excludes air, which hastens the decay of the green crop.

Foul land is quickly cleaned in this manner, as weeds are smothered and have no chance to seed, also the water-retaining capacity of the soil is increased as the store of humus is added to, and the texture of the soil greatly improved. A disadvantage is that more land must be cultivated to permit the time required to grow a green crop. On the ridges and orchards it is the custom to allow weeds to grow to prevent erosion during heavy storms. How much better would it be to grow, say, a crop of cowpeas which could be left to rot on the ground?

COMPLETE FERTILISERS FOR FARM, ORCHARD, AND VEGETABLE GARDENS.

ONIONS.

A rich light sandy loam is most favourable, but even more clayey loams may be used if limed before cultivation. The soil should be friable and contain plenty of humus or decaying vegetable matter, and must be well drained.

Stable manure should not be used immediately before planting onions, but preferably the year before. An excess of nitrogenous manure may also be injurious to the crop.

Apply per acre, according to the class of soil—

4 to 7 cwt. superphosphate,

1½ to 2 cwt. sulphate of potash or muriate of potash,

1½ to 2½ cwt. nitrolim or sulphate of ammonia,

or the same amounts in lb. to every 43 square yards.

A mixed fertiliser, containing about 7 per cent. of soluble phosphoric acid, 8 per cent. of potash and 4 per cent. of nitrogen, may be used in quantities from 7 to 12 cwt. per acre, or from 7 to 12 lb. per 43 square yards.

PARSNIPS.

This vegetable requires a rich sandy loam, which must be trenched or ploughed very deeply. An artificial fertiliser similar to the one given for carrots may be used, although the quantity of superphosphate may, with advantage, be slightly increased.

Apply per acre—

4 to 7 cwt. superphosphate;

$\frac{3}{4}$ to $1\frac{1}{2}$ cwt. sulphate of potash;

$1\frac{1}{2}$ to 2 cwt. nitrolim, or sulphate of ammonia.

PASTURE.

Ordinary pasture can be very much improved by the application of artificial fertilisers. In the case of lawns the use of fertilisers becomes imperative, and they are best applied before lawns are top-dressed.

Use, per acre, from 3 to 7 cwt. of a fertiliser, containing 4 to 5 per cent. of nitrogen, 6 to 7 per cent. of available phosphoric acid, and 8 per cent. of potash.

A good mixture for lawns is the following:—

1 cwt. fine bonemeal	} per acre.
1 cwt. superphosphate	
1 cwt. nitrate of lime	
1 cwt. muriate of potash	

or 4 lb. to 6 lb. of this mixture to every 43 square yards.

As a change the following mixture may be used alternately:—

3 cwt. Thomas phosphate	} per acre.
1 cwt. sulphate of potash	
1 cwt. dried blood	

PEANUTS.

Peanuts do best on a fairly rich sandy loam, containing plenty of lime.

They may be grown between the rows in young orchards, and the leaves and stalk will give a valuable mulch.

Use a fertiliser containing 8 to 10 per cent. phosphoric acid, 10 per cent. potash and from 1 to 2 per cent. of nitrogen, in quantities up to 6 cwt. per acre, or the following mixture:—

2 to 3 cwt. superphosphate	} per acre.
1 to $1\frac{1}{2}$ cwt. sulphate of potash	
1 cwt. meatworks manure (with blood)	

PEAS.

Peas may be grown on almost any kind of soil, but do best on a fairly rich, sandy loam. The fertilisers already recommended for Cow-peas and also for beans may be used for peas.

POTATOES.

This crop has an extremely wide range, and can be grown almost all over Queensland. Deep, friable, sandy loams, with porous subsoils are most suitable. Heavy soils, and wet, sour, clay soils, must be avoided. The soil should contain a fair amount of humus, and for this reason, potatoes do particularly well in virgin soils. The land must be cultivated deeply.

Well-rotted farmyard manure is one of the best fertilisers for potatoes, and if the heavy amounts (10 to 20 tons per acre) are not available, even small amounts used in connection with artificial fertilisers will be found very beneficial. Potash is the principal constituent of all potato fertilisers.

A complete fertiliser for potatoes should contain 6 to 8 per cent. soluble phosphoric acid, 10 per cent. potash, and 3 per cent. of nitrogen, and should be used in accordance with the quality of the soil, in quantities from 5 to 10 cwt. per acre. It is often advisable to apply phosphoric acid and potash by itself, and the nitrogenous manure as a top-dressing later on.

The following mixed fertiliser can be recommended:—

2 to 4 cwt. superphosphate	} per acre;
1 to 2 cwt. sulphate of potash	
1 to 1½ cwt. sulphate of ammonia, or nitrolim or nitrate of lime	

and if large amount of stable manure has been applied the amount of nitrogenous manure is cut down to one-half of the above quantity, and applied as a top-dressing at the time of blossoming, and in this case the quick-acting nitrate of lime is to be preferred.

In some cases muriate of potassium, or potassium chloride, gives better results than the sulphate.

RADISHES.

Radishes require a light rich garden loam, and the crop may be forced with artificial fertilisers, containing 8 per cent. soluble phosphoric acid, 10 per cent. potash and 3 per cent. nitrogen, used at the rate of 6 to 10 cwt. per acre, or 6 to 10 lb. per 43 square yards, or from 2 to 4 oz. per square yard.

The same manure as recommended for lettuce may be used.

SORGHUM.

Use the fertiliser recommended for corn.

SPINACH.

The use of well-rotted farmyard manure at the rate of 10 to 12 tons per acre, or 2 to 2½ cwt. for every 43 square yards, is particularly recommended. Lighter dressings of stable manure must be supplemented by artificial fertilisers.

Use, per acre, from 6 to 10 cwt. of a fertiliser containing 6 to 8 per cent. soluble phosphoric acid, 5 to 6 per cent. potash, and 2 per cent. of nitrogen, or use—

4 to 6 cwt. superphosphate	} per acre.
1 to 1½ cwt. sulphate of potash	
1 to 2 cwt. nitrolim or nitrate of lime	

SUGAR-CANE.

Sugar-cane is grown on almost any kind of soil on our coastal country, but gives the best returns on our alluvial soils and scrub soils, rich in humus. The same crop is generally grown continuously for a great number of years, and requires therefore proper fertilising with large amounts of artificial manures, in order to maintain the fertility of the land.

Exhausted sugar lands may be worked up again, after lying idle for a few years and allowing lantana to grow, which acts as a very valuable green manure crop, accumulating more particularly large amounts of potash.

A complete fertiliser for sugar-cane should contain about 7 to 8 per cent. each of water soluble phosphoric acid, potash and nitrogen, and should be used at the rate of 4 to 6 cwt. per acre.

The following manuring mixtures can be used, instead of the ready-mixed fertiliser:—

- | | |
|---|-------------|
| (1.) 2 to 3 cwt. superphosphate | } per acre. |
| 1 cwt. sulphate of potash | |
| 2 cwt. nitrolim or sulphate of ammonia | |
| (2.) 3 to 4 cwt. meatworks manure | } per acre. |
| 1 to 1½ cwt. sulphate of potash | |
| 1½ cwt. nitrolim or sulphate of ammonia | |
| (3.) 2 to 3 cwt. superphosphate | } per acre, |
| 1 to 1½ cwt. sulphate of potash | |
| 1 cwt. nitrolim | |
| 1 cwt. nitrate of lime | |

the nitrate of lime to be applied as a top-dressing.

SWEET POTATOES.

Sweet potatoes require, like the ordinary potato, a deep sandy loam, with a well-drained subsoil, and the same manurial treatment.

The same applies to other root crops, yams, arrowroot, &c.

LIST OF DEALERS LICENSED UNDER "THE FERTILISERS ACT OF 1914," AND REGISTERED FERTILISERS FOR THE YEAR 1915.

REGISTERED FERTILISER CERTIFIED TO CONTAIN PERCENTAGE OF:													
Name of Dealer.	Address.	Fertiliser.	Nitrogen as:						Phosphoric Acid as:			Fineness.	
			Nitrate.	Ammonia.	Blood.	Flesh, Bone, Offal.	Unspecified.	Water Soluble.	Citrate Soluble.	Total.	Potash.	Fine.	Coarse.
Associated Farmers of Queensland, Ltd. Australian Cooper Fertilisers, Ltd. Australian Meat Export Company, Ltd.	Brisbane	Various brands of Fertilisers..	..	..	..	..	..	..	..	..	..	..	..
	Toowoomba	Various brands of Fertilisers..	..	..	..	..	..	..	..	..	..	..	..
	Brisbane ..	A.M.E. Fertiliser ..	..	..	7.0	..	..	..	..	11.0	..	..	..
	..	ditto Dried Blood ..	..	12.2	..	4.05	..	..	..	24.8	..	26	74
Ditto .. Australian Sugar Coy., Ltd. .. Bateman, A. E. .. Ditto .. Ditto ..	..	ditto Bone Meal ..	..	..	12.0	..	..	..	..	..	..	..
	..	ditto Dried Blood ..	..	..	..	..	..	..	..	..	..	..	..
	Townsville	..	..	..	..	..	..	..	..	..	..	..	..
	..	ditto Fertiliser ..	..	..	5.5	..	..	..	..	18.5	..	..	..
Ditto .. Ditto .. Ditto .. Ditto ..	Mourilyan	T.C. Fertiliser ..	..	2.0	..	..	3.8	..	..	20.0	..	..	..
	Stanthorpe	Hassell's Potato Manure No. 1	2.5	..	..	..	..	12	..	12	..	..	..
	..	ditto Lucerne Manure ..	..	..	..	..	..	10.5	..	17.3	..	..	..
	..	ditto Pea and Bean Manure	3.2	..	..	..	..	12	..	15	..	..	..
Ditto .. Ditto .. Ditto .. Ditto ..	..	ditto Maize and Cabbage Manure	2.5	..	..	..	..	15.75	..	16.75	..	..	..
	..	ditto No. 1 Superphosphate	..	..	..	..	..	17	.5	18	..	..	..
	..	ditto Tomato Manure (orchard)	2.38	..	..	.75	..	11.25	..	13.95	..	..	..
	Maryborough	Mover B (indiamond) Bonedust	..	..	..	3.5	..	..	..	25	..	..	..
Baxter, H. .. Baynes Bros. .. Beatty, T. S. .. Ditto ..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Brisbane ..	Baynes Brothers' Fertiliser ..	..	..	4.27	..	..	..	..	19.75	..	..	..
	Mackay ..	Crown Brand Sulphate of Ammonia	..	20
	ditto ..	ditto Superphosphate	16

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LIST OF DEALERS LICENSED UNDER "THE FERTILISERS ACT OF 1914," AND REGISTERED FERTILISERS FOR THE YEAR 1915—continued.

REGISTERED FERTILISER CERTIFIED TO CONTAIN PERCENTAGE OF:

Name of Dealer.	Address.	Fertiliser.	Nitrogen as:					Phosphoric Acid as:			Fineness.		
			Nitrate.	Ammonia.	Blood.	Flesh, Offal, Bone.	Unspecified.	Water Soluble.	Citrate Soluble.	Total.	Potash.	Fine.	Coarse.
Croker, J.	Mackay	Shirley's 7-7-7	..	7	..	..	..	7	..	..	7	..	..
Ditto	..	Fitzroy Fertiliser	..	..	..	..	..	..	..	..	..	..	..
Dalgety and Co., Ltd.	Brisbane	Shirley's Superphosphate	..	..	5.15	..	..	13	8.88	16.94	1	..	..
Ditto	..	Hassell's Al Superphosphate..	..	..	..	..	..	17	..	..	..	..	..
Ditto	..	M.R.C. Japanese Superphosphate	..	..	..	..	..	16.5	15	17.5	..	..	..
Ditto	..	M.L. (in diamond) Superphosphate	..	..	..	..	..	19.5	..	20.5	..	..	..
Ditto	..	Runcorn Bonedust	..	..	4	..	..	17	1	20	..	..	..
Ditto	..	Bone and Blood	..	..	7.75	..	..	..	..	21.85	..	52	48
Darling Downs Co-operative Bacon Company, Ltd.	Willowburn	Hassell's Pineapple, Strawberry, and Banana Manure	..	..	..	..	..	..	5.56	6.82	..	..	..
Decker and Co.	Eagle street, Brisbane	ditto	3.5	3	..	..	..	10	..	10	..	..	..
Ditto	..	Barley and Stone-fruit Manure	2.7	..	..	2.05	..	5.5	..	13.7	..	..	..
Ditto	..	Orchardists' Manure	2.4	..	..	73	..	11.25	..	13.95	..	..	..
Ditto	..	Maize Manure	2.5	..	..	..	..	15.75	..	16.75	..	..	..
Ditto	..	Lucerne Manure	..	..	..	..	..	10.5	..	17.30	..	..	..
Ditto	..	No. 1 Superphosphate	..	..	..	..	..	16.5	5	17.5	..	..	..
Ditto	..	Pea and Bean Manure	3.2	..	..	..	..	12.0	..	15.0	..	..	..
Ditto	..	Potato Manure	2.5	2.0	..	..	..	12.0	..	12.0	..	..	..
Early, Mrs. A. B.	Chernside	Q.M.E. Fertiliser	..	..	6.03	..	..	..	14.76	15.81	..	..	..
Ditto	..	Q.M.E. Dried Blood	..	..	12.08	..	..	..	..	..	..	..	..
Foggitt, Jones, and Co., Ltd.	Brisbane	"Oxley" Fertiliser	..	..	6.15	..	..	..	..	15.5	..	..	..
Francis, J. V.	Ipswich	*Bonemeal	..	..	2.72	..	..	..	..	23.8	..	30	70

[illegible]

LIST OF DEALERS LICENSED UNDER "THE FERTILISERS ACT OF 1914," AND REGISTERED FERTILISERS FOR THE YEAR 1915—continued.

REGISTERED FERTILISER CERTIFIED TO CONTAIN PERCENTAGE OF :													
Name of Dealer.	Address.	Fertilisers.	Nitrogen as :					Phosphoric Acid as :			Fineness.		
			Nitrate.	Ammonia.	Blood.	Flesh, Bone, Offal, Unspecified.	Water Soluble.	Citrate Soluble.	Total.	Potash.	Fine.	Coarse.	
Paul and Gray, Ltd. ..	Brisbane ..	Sulphate of Potash ..	..	..	..	..	..	..	..	..	52	..	..
Paxton, W. H., and Co. ..	Mackay ..	Various ..	..	..	..	..	..	..	..	..	..	..	..
Pinder, A. W. ..	Rockhampton ..	" P.B. 8 " Fertiliser ..	..	..	1	..	..	10	..	19.4	..	..	..
Ditto ..	..	" P.B. 3 " Fertiliser ..	..	..	.7	..	..	8.5	..	12.9	..	..	..
Ditto ..	..	" P.B. 5 " Fertiliser ..	..	..	.3	..	..	5	..	12.8	..	..	..
Pohlmann, J. W. ..	Doolbi ..	Bonedust ..	..	4	3.09	..	..	..	..	24.65	..	60	40
Pressler, G. L.; and Grotherr, E. C. ..	ditto ..	Bonedust ..	..	..	2.77	..	..	..	..	25.10	..	72	28
Pumpfrey and Kyle ..	Nundah ..	Q.M.E. Fertiliser ..	..	..	6.03	..	..	..	14.76	15.81	..	..	..
Queensland Fertiliser Coy., Ltd. ..	Runcorn ..	Runcorn Bonedust ..	..	..	4.25	..	..	..	..	21.85	..	50	50
Queensland Fruitgrowers' Industrial Trading Society ..	Brisbane ..	Webster's Superphosphates ..	..	..	..	..	..	16	..	..	..	..	..
Ditto ..	..	Shirley's Superphosphate ..	..	..	..	..	..	17	..	..	..	..	..
Ditto ..	..	ditto No. 3 Fertiliser ..	..	3.3	..	..	..	13	..	..	2	..	..
Ditto ..	..	ditto No. 5 Fertiliser ..	..	3.3	..	..	..	12	..	..	7	..	..
Ditto ..	..	Sulphate of Potash ..	..	..	..	..	..	..	..	..	52	..	..
Ditto ..	..	Q.M.E. Dried Blood ..	..	..	12.08	..	..	..	..	..	..	..	..
Ditto ..	..	Q.M.E. Fertiliser ..	..	..	6.03	..	..	..	14.76	15.81	..	..	..
Ditto ..	..	Baynes Brothers' Fertiliser ..	..	..	4.27	..	..	..	..	19.75	..	..	..
Ditto ..	..	Runcorn Bonedust ..	..	..	4.25	..	..	..	..	21.85	..	52	48
Ditto ..	..	J. C. Hutton's Fertiliser ..	..	..	6.17	..	..	..	..	14.10	..	..	..
Ditto ..	..	Webster's Sulphate of Ammonia ..	..	20	..	..	..	..	..	..	..	..	..
Ditto ..	..	Webster's Sulphate of Potash ..	..	..	..	..	..	..	..	..	50	..	..
Queensland Meat Export and Agency Company, Ltd. ..	Brisbane ..	Q.M.E. Fertiliser ..	..	..	6.03	..	..	..	14.76	15.81	..	..	..

Ditto ..	..	..	..	Q.M.E. Dried Blood ..	..	12·08 |	..	..	..	..	..
Rosewarne (Queensland), Ltd.	..	Brisbane ..	..	Excel Brand Fertiliser	..	3·88	..	16·80	..	..	..
Searle, J., and Sons, Ltd.	..	Toowoomba	..	Wattle Brand Bonemeal	..	| 2·8	..	10	..	..	35
Ditto ..	..	..	..	Baynes Bros. Fertiliser	..	4·33	..	19·33	..	..	..
Taylor, C., and Co.	..	Brisbane ..	..	Shirley's Superphosphate	..	..	17	..	..	..	..
Ditto ..	..	..	..	dito No. 3 Fertiliser	3·3	..	13	..	2	..	..
Ditto ..	..	..	..	dito No. 5 Fertiliser	3·3	..	12	..	7	..	..
Ditto ..	..	..	..	Sulphate of Potash ..	..	..	..	..	52	..	..
Ditto ..	..	..	..	Mt. Lyall No. 1 Superphos- phate	..	..	17	1	20	..	..
Ditto ..	..	Torrens Creek	..	Redbank Fertiliser	..	6·46	..	13	..	..	..
Torrens Creek Meat Export Company, Ltd.	..	Torrens Creek	..	T.C. Fertiliser	..	3·80	..	20	..	..	..
Trackson Brothers	..	Brisbane ..	..	Nitrolim	..	..	18	..	..	..	..
Ditto ..	..	..	13	Nitrate of Lime	..	..	..	..	..	..	..
Tytherleigh, J.	..	Woombye	..	Nitrolim	..	..	18	..	..	..	..
Ditto ..	..	..	..	Hutton's Fertiliser	..	6·17	..	13·05	14·10	..	..
Ditto ..	..	..	..	Shirley's Superphosphate	..	| ..	17	..	..	..	..
Ditto ..	..	..	..	Q.M.E. Fertiliser	..	6·03	..	14·76	15·81	..	..
Ditto ..	..	..	..	Q.M.E. Dried Blood	..	12·08 |	..	..	..	..	..
Walker, J. J., and Co.	..	Brisbane ..	..	Torrens Creek Fertiliser	..	4·40	..	16·47	..	..	..
Walsh and Co.	..	Toowoomba	..	Downs Bac. Co. Gen. Fertiliser	..	2·84	..	14·54	..	..	..
Ditto ..	..	..	..	Hutton's Fertiliser	..	6·17	..	13·05	14·10	..	..
Ditto ..	..	..	..	Shirley's No. 3 Fertiliser	3·3	..	13	..	2	..	..
Ditto ..	..	..	..	dito No. 5 Fertiliser	3·3	..	12	..	7	..	..
Ditto ..	..	..	..	dito No. 1 Superphos- phate	..	..	17	..	..	..	..
Ditto ..	..	..	..	dito No. 9	4·1	..	6·5	..	4	..	..
Ditto ..	..	..	..	Wattle Brand Bonemeal	..	2·8	..	19·0	..	35	65
Webster and Co., Ltd.	..	Brisbane ..	..	Crown Sulphate of Potash	..	..	..	..	50	..	..
Ditto ..	..	..	..	do. Superphosphate	..	..	16	..	..	..	..
Ditto ..	..	..	..	do. Sulphate of Ammonia	20	..	..	..	..	..	..
Whiteley, D.	..	Emu Park	..	Sulphate of Potash ..	..	..	..	..	52	..	..
Ditto ..	..	..	..	Sulphate of Ammonia	20	..	..	..	..	..	..
Ditto ..	..	..	15·5	Nitrate of Soda	..	..	..	..	..	..	..
Ditto ..	..	..	..	Shirley's No. 3 Fertiliser	3·3	..	13	..	2	..	..
Ditto ..	..	..	..	dito No. 5 Fertiliser	3·3	..	12	..	7	..	..
Wood, T. H.	..	..	..	Bonemeal ..	..	| 4·07	..	24·2	..	50	50

CORN-GROWING CONTEST, 1914-1915.

Following is an example of the Record Chart that was kept by one of the competitors in the corn-growing competition held under the direction of the Department of Agriculture and Stock, which commenced in 1914 and terminated in 1915. Another competition has been arranged for the season 1915-1916 under the same conditions. This chart was kept by an energetic young farmer in the Crow's Nest district, and, had the season been favourable, no doubt his energy would have been rewarded. He has now enlisted in the military forces, so will not be a competitor on this occasion:—

PARTICULARS ABOUT THE PLOT AND ITS PREPARATION.

Nature of Soil—Light, loamy forest soil, between a light black and chocolate colour.

Nature of Subsoil—Sub-soil in places consists of a heavy yellow clay, while other parts are gravelly.

Situation of Plot—Plot runs over the summit of a spur of the range, and slopes to east, south, and west.

Previous Cultivation or History of Plot—Plot has never been cultivated or worked in any way before, and up to this year (1914) has been heavily timbered with green iron-bark saplings, also a fair quantity of dead timber. As a rule, it carries a fair weight of grass, and up to September, 1913, was open to stock. It was then fenced, and from then on was not trodden in any way.

When Preparation of Plot commenced—Preparation commenced on 10th day of August, 1914.

Was Manure applied?—No manure was applied.

How was the Plot Prepared? (Competitors here to state fully how, and when, and why each operation was carried out; the condition of the soil as to moisture and fineness at each stage of working, the implements used, depth of working, difficulties experienced, &c.)—According to general ideas concerning farming, my plot does not stand a very good chance of bringing me in the first prize, as the soil is too new and sour from not having been worked. During the first week we commenced clearing operations in extremely dry and hot weather, but ideal conditions for the work. We stumped out the green saplings with axe and mattock, and burnt out all dry trees and stumps. Having filled up all holes remaining after burning, we intended to wait for rain to make the soil easier to work.

After waiting some little time and still no rain, we came to the conclusion that there was none to come, so decided to break the ground up dry. Accordingly, on Monday, 10th August, 1915, we started ploughing operations with three horses and a Newl-Saunders' improved single-furrow disc plough. The soil worked better than we anticipated, the only fault being that the sods in places would break away right down to the subsoil, making a very uneven furrow for the plough wheel to run in on the following round, and also leaving the ploughed land in a very rough condition.

Of course, we struck the usual collection of roots, stumps, &c., which was only natural; but, as two men followed the plough all the time, any obstruction was soon removed. The only real trouble we encountered was caused by the uneven bed of the furrow, which I have already mentioned. The disc stood the shaking splendidly until, happening to strike a specially rough patch, one of the main bolts broke in halves. Just as luck would have it, we had not another bolt in the place that would fit; so we were completely euchred. We were not beaten, however. So pulling the disc out of the way, we hooked on to a heavy English iron plough, made for the purpose, and finished the field with that.

The ground then lay in that condition for about four months, with scarcely a drop of rain, certainly not enough to soften the clods. A succession of storms early in December, however, had the desired effect, and I got on to the land with the harrows. After six or seven harrowings, the clods broke up sufficiently to allow of cross-ploughing—again with the disc plough. Of course, this was much easier than breaking up, and very little difficulty was experienced. The continued dry, hot spell had one good effect in that it completely killed the roots of the grass which were assisting to bind the soil together, so that after a thorough saturation the clods broke up rather easily.

After cross-ploughing it was harrowed again half-a-dozen times, till the soil was, in a certain measure, fit for planting as regards fineness and moisture. Of course, after breaking up, the soil was in the roughest possible condition and absolutely parched. The depth of ploughing was 5 in. On cross-ploughing, the depth was 6 in., while the sods were now broken up into squares as it were, and beginning to crumble. The ground was fairly moist, but, on account of the rough, open condition, moisture was not retained.

When we commenced planting, parts of the field were in very fair condition, the soil having crumbled up splendidly, while other parts were still very rough. Of course, I claimed the best corner for my plot, and was not refused.

Heavy rain fell during planting operations, so that the condition of the plot as regards moisture can easily be judged.

The only difficulty experienced was in the covering. I reversed the two outside hoes of the scuffler and raised the back one. In this way, by driving the horse in the drill and keeping one of the sides hoes on each side of the drill, both threw the soil inwards and so covered the seed effectively. But in the rough places the clods would jam up around the hoes, making them skid, so that I was continually stopping to clean them. However, I got all the drills covered; and on the 26th December I harrowed the field, and from then on I have been watching the crop grow, and dreaming of what I will do when I win the prize.

PLANTING.

Condition of Soil as to Moisture at Planting—Corn planted immediately after 1.20 in. of rain had fallen, so that the ground was thoroughly moist.

How was the Seed Sown?—The land was drilled out and the seed planted by hand and covered with a scuffler.

Was any Fertiliser applied?—No.

Was Seed Planted Singly, or in Groups or Hills?—The seed was planted singly.

Distance between Plants or Hills—The seed was planted roughly about 1 foot apart.

Distance between Rows—The distance was not accurately measured, about 4 feet.

Direction of Rows (north and south, or east and west)—Rows planted east and west.

Date of Commencing Planting—Commenced planting on 23rd December, 1914.

Date of Finishing Planting—Finished planting on 24th December, 1914.

Depth of Planting—The seed was planted about 4 in. deep.

PROGRESS OBSERVATIONS.

Date of First Appearance of Young Plants—First plants appeared on 27th December, 1914.

Time taken before all Plants are up in Rows—All plants up in rows on 30th December—seven days.

Number of Blanks re-seeded—No blanks re-seeded, as corn came up splendidly.

How Cultivated (Competitor to give in the form of a diary full particulars of the operations adopted to break soil crusts, cut out weeds, and keep in moisture)—27th December: First plants showing though. 30th December: All plants up in rows and looking very healthy. 14th January: Rain came and washed some of the plants out—a calamity, as every stalk may count. 18th January: In walking over the plot to-day, I noticed that weeds were coming in places. In this matter the new ground has the advantage as, speaking comparatively, there are scarcely any weeds. However, the few that are there must come out, as the weather is very hot and the moisture soon goes. 19th January: Commenced scuffling to-day with a very bad horse. At other times when scuffling, I do not take much notice if I destroy a few plants, but this time when the horse treads on one of my stalks I feel almost as bad as if he trod on me. However, the soil falls apart splendidly and I am having no trouble in killing the weeds. 20th January: Scuffling finished and the result is a very satisfactory job, in my opinion. Plants are now about 2 ft. high and growing exceptionally quickly. 27th January: Still growing, but beginning to look very bad during the heat of the day. My visions of the first prize are also becoming very dim. The worst part of it is that nothing can be done to improve matters, as there is not a weed to be seen anywhere and the soil is nice and loose. 4th February: In walking over the plot to-day, I noticed that the Early Leeming maize appears to be bad for suckers, as my

plot is thick with them, while 90-Day maize near at hand is entirely free. Otherwise the two varieties appear much the same so far. 8th February: First tassels noticed to-day, and the weather is horribly dry. In spite of this, corn is about 5 ft. high, but very withered. Pulled all the suckers from plot to-day to allow the main stalks all the moisture possible. 4 p.m.: Hopes reviving, as storm clouds appear in the west. A good downpour now will make a vast difference. 9th February: The first prize again appears before me. Smart storm yesterday evening, and good steady rain all to-day; in all about $3\frac{1}{2}$ in. fell. This will do a world of good. 20th February: Several more light showers to-day. Corn is beginning to show cobs, but these light showers don't last long. We want another good soaking rain to produce proper growth. There appears no chance of this, however. 28th February: Getting very downhearted again. Dry, dry, dry—everything is dry—myself included. Corn withering again. 2nd March: Calamity altogether. Dreadfully hot day with scorching south-westerly winds and dust storms. Another day like this and I am ruined, or, rather, my chances of the prize are.

Weather Conditions during Early Growth—The weather conditions during early growth have been absolutely bad, no rain having fallen since plants were a fortnight old. They are now six weeks old, and are having extremely hot, dry weather, which causes the leaves to curl up completely during the heat of the day.

Date of First Appearance of Tasselling—First tassels noticed Monday, 8th February, 1915.

Weather Conditions during Tasselling and afterwards when Cobs are Forming—Just as the first tassels appeared—*i.e.*, on the 8th—we had good rain; but then it was dry and hot again, so that the cobs did not make proper growth. Rain fell again on the 5th March, however, which improved things considerably.

Was Plot Watered other than by Rain?—No; plot depended entirely on rain for moisture.

WOMEN IN AGRICULTURE.

The enrolment of a female student at the Dookie Agricultural College, with the report of the principal, Mr. Hugh Pye, to his council in regard to the innovation, raises an interesting and important question. A change is indicated in the relationship of women to agriculture, and, like every other change, it will be looked upon with both approval and condemnation by different observers. The development of modern conditions of life has greatly widened and changed the sphere of women's industrial and business activity, and, whether we approve of the change or not, it is important for us to recognise it and observe the direction of its tendency. When agriculture is compared with the other industries into which women are entering with increasing energy, little can be discerned in it that is calculated to preserve it as an exclusive sphere for men's occupation. As a matter of fact, there are many aspects of it

specially suitable for women, and there is nothing surprising in the fact that it should be invaded by the forces of the modern movement. In reality the invasion has been proceeding for a considerable time, and has already assumed considerable dimensions. Not much can be done to stop movements of this kind, even when it is desirable to do so. In this case there is little evidence that a larger participation in the agricultural industries would not be to the advantage of agriculture as well as of the general condition of society.

To understand what is new in this modern innovation it is necessary to remember that agriculture or farming consists of many widely varying branches. It not only embraces numerous differing branches connected with the cultivation of various crops and the keeping of different classes of live stock, but, like other industries, it must be considered in two aspects—viz., in regard to the work or labour involved, and in regard to the skill or knowledge employed in its management or direction. There are “farmers” and “farm labourers,” and it is well to observe which of these two classes is meant when women are spoken of as engaging in agricultural occupations. Are they becoming occupiers and managers of farms, orchards, and vineyards, or are they serving as labourers on such places? There is surely nothing new in women engaging in farm work. They have in the past always taken an important part in the work of the field, of the farmyard, of the byre, and the dairy, as well as the orchard and the vineyard. As a matter of fact, modern progress has been in the direction of decreasing the proportion of female labour in agriculture, and in new countries like Australia, Canada, and the United States the almost entire absence of women from the fields is a marked feature of their newness. The new movement, therefore, cannot be a proposal for women to undertake farm labour. There are departments of farm work which are in their nature unsuitable for women. These have rarely been allotted to female labourers, and the new movement surely does not propose a backward step in this direction. This brings us back to the Dookie student, who has given rise to the discussion, “What is she doing?” She is certainly not preparing to be a farm labourer. It is not necessary to study the rudiments of the sciences upon which agriculture is founded in order to be a farm labourer. She is manifestly learning to be a “farmer”—to manage farm property and direct labour. If with the male students she works on the farm, it is not because she expects to have to do all branches of farm work herself when she becomes a farmer, but because, like the male students, she may know how to direct farm labourers. It is in aiming at being a “farmer,” an “agriculturist,” that this student is doing anything out of the common, and here we have the real nature of the innovation. What claims have women to be considered fit for assuming the position of farmers or managers of agricultural enterprises?

If we look at agriculture in its normal condition, as it has been conducted in the long past, and not in its changing modern phases, the part taken by women is found to have been by no means an unimportant one. The farmer has been assisted in his industry by his wife and his

daughters as well as by his sons. It has to be remembered that a farm is a home as well as an establishment for providing the means of living, and the home has always been an important department. Neither have modern developments decreased the essential value of the home department. There has certainly been evolved in the pioneering stages of agriculture in the new countries of America and Australia a crude type of producing centres, where wheat or live stock are raised under a rough and temporary system of exploitation. These, however, are not "farms," and the systems adopted are not farming. They are "camps," "ranches," or "stations," and they have to be followed in the course of progress by farms on which the homes must take their essential position of importance. When the relation of the home to the prosperity of farming is considered, it is realised that women have always been vitally associated with agriculture, and it is further manifest that farming, more than any other industry, is dependent upon woman's work and her special services. Modern changes have seen women invading many spheres in which the duties could be performed at least as well by men, but the case is different in relation to agriculture. A withdrawal of the part which woman has hitherto taken in farming would evidently be fatal to the industry, however well she could be spared from other spheres of business or occupation. It may, therefore, be in the interest of farming if women are now seeking to assume a larger share in the conduct of the industry.

But, before considering woman's fitness for a wider sphere of agricultural duties, it may be well to reflect upon the effect which is being produced upon the industry by other features of modern developments. Those tendencies which have produced the great cities and towns of the industrial age have, in all progressive countries, brought about a serious depletion of rural population. "Back to the land" is a cry which, for more than a generation, has voiced the suffering of agriculture by the loss of its producing population. Statesmen are agreed that one of the greatest needs for the accomplishment of permanent prosperity is an increase of primary production. This need is recognised in this country as clearly as in other parts of the world. While opinions differ as to the means by which primary production can be increased, no one disputes the vital importance of the object itself. In studying the causes and the remedies of rural depopulation, attention is too much confined to industrial or financial factors, and insufficient weight is attached to social influences. The effect upon this problem of the attitude which women have assumed towards agriculture and rural life has been more potent than has been recognised. What are the views of city girls in regard to marrying a farmer? The question is easily answered. It is not his income that is objected to, but the life such a marriage involves. If the city girl were willing to become a farmer's wife, what kind of a wife would she make? That question is also easily answered. It is evident that the young farmer would do well to marry his neighbour's daughter. But where is the neighbour's daughter? Perhaps whenever she left school she emigrated to the city. She, in fact, is probably one of those

city girls who decline to marry a farmer. As we have seen that the home is an essential part of the farm, with what difficulty farming and primary production are to be promoted until some important social changes are brought about. It may be that the movement suggested by the Dookie student under notice is the beginning of those necessary social changes.

If we inquire how far the part played by woman in agriculture hitherto suggests fitness for the leading rôle now being assumed, there is much to encourage expectation. Farmers' wives, as managers of the important home department, have been called upon to exercise many of those functions which have to be applied to the other branches of the farm—foresight, economy, industry, patience, skill, judgment in buying and selling. Have not farmers' wives displayed, as a rule, these qualities in the management of the house, the dairy, and the poultry yard as successfully as the farmer has done in the department under his direction? It may even be claimed that the farmer would have been more successful if his operations had been to a greater extent governed by the principles of "domestic economy." It has often happened that the head of a farming family has been prematurely removed, and the mother has had to assume the management in his place; but how seldom has she failed? It is difficult, indeed, to point out any feminine quality which is a disqualification for the management and direction of agricultural industries. Certainly there are departments of farm labour which are not suitable for women, but there are also departments of farming quite unsuitable for men—viz., those undertaken by farmers' wives. It is the directorship that women now proposes to assume, and it is difficult to deny her qualifications. It is likely, therefore, that women students at agricultural colleges will increase, and not improbable that the agricultural college in England for training girls will have its imitators. One result may be the elevation of agriculture and rural life in the estimation of young women, and than this nothing could do more to check the drift of agricultural population to the cities and bring about the necessary increase in primary production.—"Australian Farm and Home."

THE QUEENSLAND COTTON CROP OF 1914-15.

In connection with the cotton crop for this year, it is the intention of the Minister of Agriculture to take in hand the treatment of the crop in the same manner as was done last year, that is to say, that the Department will advance 1¾d. per lb. on the raw cotton, and afterwards sell the cotton and seed and distribute the profits amongst the suppliers. The Department will not make any charge for the work, but will deduct

any expense incurred in obtaining additional labour. Last season there was a small crop (9,445 lb. of seed cotton) which, when treated at the ginning house established at the Department of Agriculture, resulted in a yield of ginned cotton which, after all expenses were paid, enabled the Department to distribute an additional return over and above the 1½d. per lb. advanced to suppliers. It would be well if farmers would realise that cotton is a drought-resisting plant, that it requires little cultivation after it has made a good stand; that, beyond the boll worm, which can be overcome by alternative rows of cotton with a few rows of maize (which the insect prefers to cotton bolls), no disease troubles it. Had there been large areas of cotton planted in the districts which have, in the first half of the year, suffered so severely from drought, the growers would have realised very fair profits, the American quotations for ginned cotton being now 7d. per lb. and likely to go higher. When the present war is over, and many more settlers come to this State, we shall probably see cotton-growing established on a firm basis.

At the time of the Civil War in the United States of America, when American cotton could not be obtained except through successful blockade runners, Queensland had a splendid opportunity, and cotton was largely grown for several years, the farmers receiving 3d. per lb. for good seed cotton. Now 1,000 lb. of seed cotton (Uplands) is an ordinary return per acre, and as much as 1,500 and 2,000 lb. have been picked per acre in Queensland. How does a crop of 1,000 lb. of cotton compare with a 40-bushel crop of maize? In normal seasons, when good crops of maize are harvested, the average price per bushel may be put at 3s. 6d. to 4s., which is £8 per acre. The 1,000 lb. of cotton at 2d. per lb. amounts to £8 6s. 8d. per acre. But the cost of harvesting the crops has to be taken into consideration, when we come to reckon the profit. Maize has to be pulled, husked, threshed, winnowed, and bagged. Cotton has to be picked, sunned for a few hours, and bagged. In both cases white labour is employed. Cotton-growing in this State is a white man's job. If he has a family, he need employ no outside labour to pick it, which means ½d. per lb. saved to the farmer. Furthermore, in these days, the seed has a great value, which it had not in the sixties and seventies in Queensland. The seed which was then thrown out as useless, now brings from £4 to £6 per ton for oil and cake purposes. The 600 lb. of seed contained in a 1,000-lb. crop is worth from £1 to £1 10s. We have written so much about cotton-growing and its possibilities and certainties, that at the moment of writing we are wondering that many dairy farmers, who are to-day threatening to dry off their cows and give up dairying for the purpose of supplying the wants of cities, do not devote a few acres to a crop which will leave them a profit instead of what their present business shows, as they tell us, a dead loss. It is not

known how much will be sent in this season. It is believed that if the industry weathers the next year or two it may become more firmly established in Queensland, but, as is well known, the difficulty is the cost of labour for picking. A machine is now being tested which it is hoped will overcome this trouble. It is designed on the vacuum principle. The area planted last year was 134 acres, the yield being 20,336 lb. of seed cotton.

CHANGES IN THE DEPARTMENT OF AGRICULTURE AND STOCK.

Mr. H. C. Quodling to be Director of Agriculture. Connected with Mr. Quodling will be the Instructors in Agriculture, Messrs. G. B. Brooks and A. E. Gibson; the Field Assistants, Messrs. E. R. Ashburn and H. Bechtel; also the travelling exhibit, which has been sent round to the various shows by the Department; and the State Farms at Hermitage, Bungeworgorai, Warren, Gindie, and Kairi.

Mr. A. H. Cory, M.R.C.V.S., has been appointed Chief Inspector of Stock, and will attend to stock and slaughtering matters in that portion of the State south of Mackay and of the 22nd parallel. He will also exercise veterinary supervision over the Stock Experiment Station at Yeerongpilly.

Mr. G. Tucker, M.R.C.V.S., will be Northern Deputy Chief Inspector of Stock, and will act as Director of the Stock Experiment Station at Townsville, besides attending to stock and slaughtering matters throughout the districts north of the 22nd parallel.

Mr. A. H. Benson, who has been appointed Director of Fruit Culture, took up his duties at the beginning of September. He will attend to all matters affecting the fruit industry, including the administration of the Diseases in Plants Act and the Fruit Cases Act. He will also exercise supervision over the State Nursery at Kamerunga, Cairns.

Mr. Cuthbert Potts, B.A., has been appointed Principal of the Queensland Agricultural College, Gatton, and took up his duties there at the end of September. Mr. Potts comes from the Hawkesbury Agricultural College.

Mr. R. P. M. Short has been appointed Registrar of Brands, while Mr. A. T. Jefferis, B.Sc., has been appointed Science and House Master at the Agricultural College, in succession to Mr. Ellard. Mr. Jefferis was formerly in the Department's Chemical Laboratory. Mr. A. R. Wilkin has been appointed Instructor in Cheesemaking, and his position as a Cream Inspector has been filled by Mr. W. S. Hartley, formerly Dairy Inspector at Nanango.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE,
GATTON.

MILKING RECORDS OF COWS FOR MONTH OF AUGUST, 1915.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commer- cial Butter.	Remarks.
			Lb.	%	Lb.	
Lennie ...	Ayrshire ...	23 July, 1915	1,000	3·8	44·57	
Iron Plate ...	Jersey ...	2 Feb. "	539	5·5	35·05	
Lady Twylsh ...	" ...	5 June "	531	5·0	31·33	
Noble Dot ...	" ...	2 May "	532	4·8	30·12	
Bluebelle ...	" ...	20 June "	628	3·9	28·73	
Netherton Belle	Ayrshire ...	23 April "	549	4·3	27·82	
Miss Bell ...	Jersey ...	2 July "	529	4·4	27·39	
Lark ...	Ayrshire ...	17 June "	559	4·0	26·25	
Gretchen ...	Holstein ...	15 Aug. "	598	3·4	23·75	
Lady May ...	Ayrshire ...	7 Mar. "	518	3·8	23·07	
Black Bess ...	Jersey ...	4 June "	451	4·3	22·82	
Lady Athol	Shorthorn...	27 May "	506	3·7	21·94	
Thornton's Fairetta	Jersey ...	27 Mar. "	351	5·0	20·71	
Lady Lil ...	" ...	27 June "	366	4·4	19·37	
Rosine ...	Ayrshire ...	7 Aug. "	435	3·8	19·37	
Cocoatina ...	Jersey ...	6 Mar. "	316	5·0	18·64	
Princess Kate	Ayrshire ...	9 July "	463	3·4	18·43	
Lady Melba	Holstein ...	6 Mar., 1914	399	3·9	18·25	

Grazed on natural pastures, supplemented by a ration of 30 lb. of maize ensilage daily.

GOAT'S MILK FOR TICKS.

Mr. J. F. Keane, Carbeen, writes:—Your article on milch goats in the June issue of the Journal tells me much I did not know, and encourages the idea that we may be on the brink of a very big thing. I have lately met farmers who have raised calves on goats' milk, and all are quite positive that the calves had no ticks on them while receiving the milk. To quote the words of one of them: "I thought everybody knew that, but it is really no good, since they get ticky again as soon as they are turned out." To my mind, the matter is set at rest. It is the goat's milk that kills the tick. Now, if the active principle, whatever it may be, that protects the goat, can slay a comparative monster like a cattle tick in the attenuated form in which it must reach it through the mamma of the goat and the digestion of the calf, what chance would a little thing like a tubercle baccillus stand if it met the full strength of it? If the histologist and bacteriologist ever isolate the goat's "good fairy," something makes me think it will turn out to be an inherent corpuscle rather than a virus.

TO PREVENT MILK FROM CREAMING.

The natural tendency for the minute fat globules is to rise to the surface of the milk, and this will happen to a greater or less degree irrespective as to whether the creams are stirred up by a rotary or semi-rotary movement of the stirring apparatus. The most effectual method of keeping the fat globules intermingled with the milk in anything approximating even proportion is to be attained by stirring the milk by means of a plunger. The adoption of this method is effectual in carrying the fat globules down amongst the lower milk strata.

* NOTES ON THE NEED FOR AND THE VALUE OF ENSILAGE.

The silage method of preserving crops for future need does not take hold with the force that its undoubted merits would justify, and, despite the activity of Officers of the Department of Agriculture in their efforts to popularise the silo as a means for the conserving of fodder in a form highly suitable for sustaining the dairy herd, little addition has yet been made in the quantities of silage prepared from year to year, and the amount of ensilage annually prepared has never reached 5,000 tons—a poor record, indeed, for a State concerned in providing sustenance for 365,000 milch cows.

It is during a season like the past, when the failure of both grass and fodder crops occurred in many districts, that the true value of silage is to be readily recognised. By enabling the surplus crops of a favourable season to be held over in a succulent condition for use during a subsequent “dry spell,” the silo provides the safest form of insurance against the depredations of a drought, and renders the farmer practically independent of the influences of adverse weather conditions.

The silo is a necessary adjunct to the dairy farm, and the value of ensilage as a fodder is fully appreciated by dairying communities the world over, except, possibly, in Queensland, where neither the silo nor any substituted method of conserving fodder seems to gain the favour of the dairy farmer.

It is only necessary to instance the disturbing influence exerted by the recent dry spell upon the volume of the production of dairy products, in order to gain an insight into the amount of wealth lost to the dairying community on account of improvidence and non-acceptance of the silo as an approved method of fodder conservation. The dairy farmers operating without a supply of fodder in reserve were forced to purchase food for their stock in the open market at a rate which prohibited the production of milk at a reasonable cost; and, instead of the dairymen being in a position to take advantage of the relatively high prices maintaining for dairy produce throughout Australia at the time, they were actually conducting their dairies at a loss.

Cases of dairy farmers being compelled to temporarily relinquish dairying, and place their dairy herds upon agistment in more favoured localities, were of common occurrence.

* Contributed by the Director of Agriculture and Mr. G. Graham (Dairy Expert).

An adequate supply of ensilage upon the farms would have eliminated or, at least, materially reduced the distress directly occasioned by the scantiness of the rainfall. Our methods of farm husbandry must remain incomplete until such time as silage is afforded greater attention by stockowners.

Ensilage exerts a decided tendency towards equalising the summer and winter production of dairy produce, for by its use silage assists in keeping the milk yields even and permanent throughout the year.

Ensilage is an attribute to success in dairy enterprise, and a bountiful supply of this fodder contributes largely to the profits derivable from the well-managed dairy farm.

The Stock-raisers resident within the closely settled areas can ill afford to be without the silo and its attendant advantages, particularly as a ration of ensilage is relished alike by oxen, sheep, and swine. These animals thrive when fed upon the succulent silage, which is equally efficacious for the purpose of producing flesh or milk when used in conjunction with a food rich in protein such as lucerne or cowpea.

It must be recognised at this period, when high prices for building material prevail and when people are anxious to husband their resources, that the time would be inopportune to advocate an outlay for silo and plant; consequently, immediate expansion in the way of conserving fodder must be on inexpensive lines, and in this connection the method of putting up green fodder in an approved manner in the form of a silage stack should readily appeal to all dairymen and stock-owners within closely settled areas.

For reasons stated, it is the aim of the Department of Agriculture and Stock to encourage fodder conservation throughout all Dairy districts.

The results accruing from previous work carried out under the direction of Officers of this Department have demonstrated the efficacy and practicability of the methods advocated.

This year it is purposed to send Officers out to give demonstrations in approved methods of silage-stack construction at a number of different dairying communities. These Officers will work in conjunction with the respective Dairy Inspectors, who are now making inquiries and organising with a view to the initiation of a widespread scheme of fodder conservation. The primary effort is to secure two farmers in each district willing to grow crops for the purpose of providing supplies of green maize to be used in connection with the demonstrations previously referred to. Naturally, it is anticipated that a considerable number of farmers in each locality will also plant up areas with fodder crops and actively engage in their preservation in a similar manner.

It is considered that a decided impetus would be given to the movement by various Farmers' Progress Associations encouraging discussion on this subject amongst their respective members. In this way it is possible that publicity may be given to the whole project, and the need of the Silo and the economic part it should play in farm husbandry thereby brought home to those immediately concerned.

TO ESTIMATE THE AMOUNT OF COMMERCIAL BUTTER CONTAINED IN MILK OF VARYING BUTTER-FAT TEST.

In connection with this matter the following noting has been made by Mr. E. Graham, Dairy Expert:—

“Usually the amount of commercial butter to be won from milk of a given test is to be most readily and accurately estimated by reference to a chart. In this State, O’Callaghan’s Chart is in general use, and the chart is procurable from most booksellers of note. In the absence of the chart for determining the commercial butter content of a known quantity of milk of a given test, it is possible that the most accurate formula to be adopted for this purpose is as follows:—

First deduct .22 from the butter-fat test; then multiply the remainder by the number of pounds of milk; next divide the product by 85. The quotient represents the estimated yield of commercial butter.

Example.—Find the commercial butter-fat content of 85 lb. of milk testing 3.8 per cent. of butter-fat—

$$3.8 - .22 = 3.58 = 358$$

100

We then have—

$$\begin{array}{r} 358 \times 85 \\ \hline 100 \quad 85 \\ = 358 \end{array}$$

$$\begin{array}{r} 100 \\ = 3.58 \text{ lb. of commercial butter.} \end{array}$$

MAINTENANCE OF YOUNG PIGS.

In laying down plans to maintain 100 pigs and carry them on to a fattening stage, either the initial work entailed in the rearing of the animals has been overcome, or else some natural supplementary food from the dairy farm or factory is available.

A supply of milk or by-products plays such an important part in the management and early life of young pigs that the change to their maintenance on “grazing” or “soiling” crops should preferably be a gradual one, and for obvious reasons the chief crops should be rich in flesh-forming constituents.

Lucerne is practically the main stand-by for pig-raising on this account. At certain periods of the year mature crops of cowpeas are invaluable also for the same purpose, and for fattening.

Apart from the consideration or the element of danger in using immature plants of the Sorghum family as food for animals, the crops mentioned by Mr. Evans—viz., Sorghum, Kafir Corn, Panicum, and Millets—if grazed as early as intended, will not supply the character of

food necessary for maintaining growing pigs, nor will these fodders be altogether satisfactory for assimilation in large quantities. From the investigations of the Agricultural Chemist it would appear that there is always danger in using plants of the Sorghum family when immature, and for this reason other crops are to be preferred if such a choice can be made. The seed heads of Kafir Corn and Sorghum make excellent food to supplement other classes of farm crops, and play an important part also in pig maintenance and for fattening.

Without a fuller knowledge of the conditions under which it is purposed to keep these pigs, generalities can only be touched upon—that is to say, the names of the most suitable crops for pig-feeding can be given, and the sowing of these crops to maintain a continuity of feed depends a great deal on the judgment of the person who is in charge of the animals and the conveniences at hand. A supply of green food in the way of Lucerne can only be kept up throughout the greater part of the year by means of irrigation. Other crops which can be grown under field conditions may be set down as follows:—Rape and Barley for sowing in March and April. Field Peas of various kinds in May and June. Maize, Kafir Corn, Sorghums, and Cowpeas in Spring and Summer. Cabbages, Swede and other turnips for planting in late February, March, and April; Mangels in April and August. Sweet Potatoes, Jerusalem Artichokes, Pumpkins, and Melons in Spring.

LICE ON PIGS.

To get rid of this trouble, cleanse the skin thoroughly with soap and water, and then rub in a decoction of Stavesacre—1 part to 40 parts. water.

FEEDING MOLASSES TO SHEEP WITHOUT CHAFF.

In reply to a correspondent on this subject, Mr. W. G. Brown, Instructor in Sheep and Wool, advises as follows:—

“Without roughage such as chaff, or old grass, molasses would not be a valuable feed for stock. A sheep drinking molasses would allow the liquid to pass directly into the 3rd or 4th stomach and right through the system. It is doubtful if sheep or any other animals which chew the cud would get much benefit from molasses. It would act as a purgative.

“The usual proportions of molasses to water used in mixing with rough feed of any kind is half water, half molasses, with about 2 oz. of salt to the gallon of mixture; this is mixed up with the chaff. In my opinion a method of feeding to keep sheep alive, which was used at Thurulgoona in 1902, would be quite as good, and very little dearer.

“About 4 oz. of maize per head per day, thrown on the ground in the form of a circle 50 yards in diameter, will keep sheep alive easily, and will cost one-third of one penny per day with corn at 6s. per bushel. I know this saved the lives of 30,000 sheep fifteen years ago.

“Molasses is good with roughage. In pure liquid form, not nearly so good.”

THE LATE P. R. GORDON.

Amongst the many old colonists who have lately passed away, and whose loss must be considered as almost a national one, is P. R. Gordon, who for many years held the position of Chief Inspector of Stock in the Department of Agriculture and Stock. In his youth he received his first training in the office of a solicitor or writer to the signet, in Aberdeen, and afterwards took great interest in matters dealing with stock of all kinds, which training was to stand him in good stead when, later on, he left the old country and settled in Victoria, where he became a station owner and manager. Subsequently he went to New South Wales, and was appointed metropolitan inspector of stock under the late Alexander Bruce. He assisted Mr. Bruce in stamping out the scab disease in sheep in New South Wales. In 1867 Mr. Gordon came to Brisbane, where he received the appointment of Chief Inspector of Stock. In that year he assisted to draft the Diseases in Sheep Act of 1867. and subsequent amendments. He was also the originator of the Brands Act of 1872, and, having had experience of the working of the Brands Act in New South Wales, he framed the Queensland '72 Act, which is, without doubt, the best system in Australasia, if not in the world. In Mr. Gordon's early days, there were no Parliamentary Draftsmen, and therefore, the framing of the Stock Acts, &c., devolved greatly on him, and his earlier experience in a lawyer's office greatly aided him in this, and similar work. He was, in conjunction with the late John Fenwick and Gresley Lukin, the originator of the present thriving institution, the Queensland National Agricultural and Industrial Association. Versatile in his accomplishments, he was one of the founders and chief supporters of the Brisbane Musical Union. He played several instruments, amongst them the drum tympani, and if the drums went astray, he took a score and sang in the chorus. In all expositions, such as the Indian and Colonial and others to which Queensland exhibits were sent, he was a leading factor in advancing the State's interests. He and Mr. Bruce were originators of the Annual Conference of Chief Inspectors of Stock of Australasia, conferences which were held alternately in the different States, with a view to establishing uniformity in all matters connected with the movements, diseases, &c., of stock. Mr. Gordon was always an advocate of a Stock Institute on the lines of the Pasteur Institute, to which all matters connected with stock should be submitted. In this, however, he was not supported by the other States, but he succeeded in founding the original Stock Institution, which was located in a temporary building in Turbot street, Brisbane, of which Mr. J. C. Pound (now Director of the Yeerongpilly Institute) was appointed director.

Those who were intimate with him will remember him as a good raconteur, reciter, and comic singer, his favourite comic song being "The Lively Flea." Mr. Gordon was always a strong advocate for introducing new blood into the flocks and herds, horses, and swine in the State. He compiled, and issued at one time, "The Drovers' Guide," which embodied the best parts of the various Acts he assisted in framing.

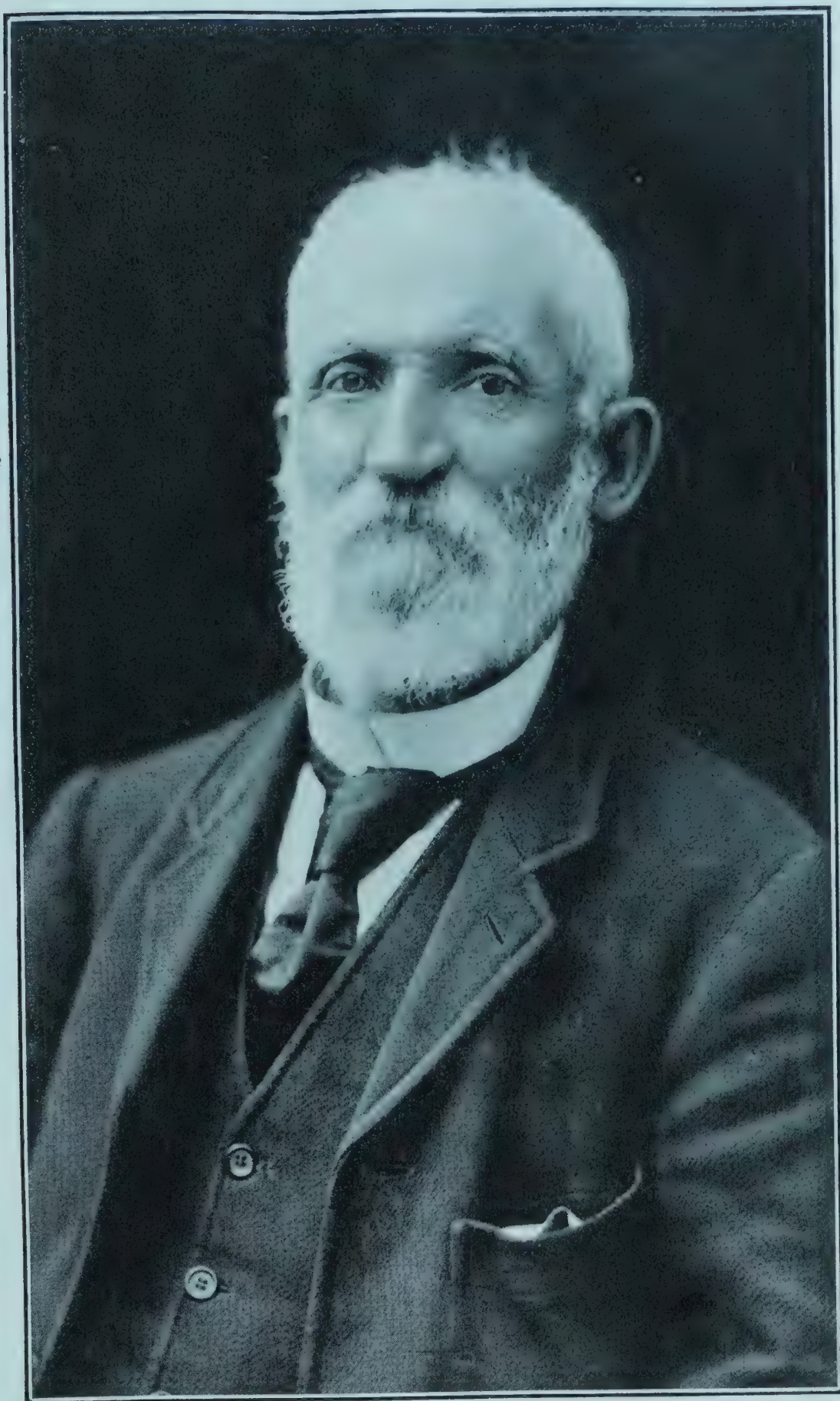


PLATE 16.—THE LATE P. R. GORDON, CHIEF INSPECTOR OF STOCK FOR
QUEENSLAND FROM 1868 TO 1904. •

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, JULY, 1915.

Six thousand five hundred and sixty-three eggs were laid during the month, an average of 123.8 per pen. Most of the birds have now settled down to work and are doing well. E. A. Smith's Black Orpingtons win the monthly prize with the splendid total of 150 eggs. The following are the individual records:—

Competitors.	Breed.	July.	Total.
Jas. McKay	White Leghorns ...	144	507
Mrs. J. Jobling, N.S.W.	Black Orpingtons ...	135	505
Mrs. Munro	White Leghorns ...	131	454
J. Gosley	Do. ...	146	454
J. D. Nicholson, N.S.W.	Do. ...	117	435
A. W. Bailey	Do. ...	133	429
C. E. Bertelsmeier, S.A.	Do. ...	118	428
S. E. Sharpe	Do. ...	131	426
J. R. Wilson	Do. ...	130	423
J. M. Manson	Black Orpingtons ...	144	416
King and Watson, N.S.W.	White Leghorns ...	129	416
Kelvin Poultry Farm	Do. ...	136	416
E. F. Dennis	Do. ...	126	403
A. H. Padman, S.A.	Do. ...	107	402
C. F. Clark	Do. ...	124	400
A. T. Coomber	Do. ...	113	386
T. Fanning	Do. ...	116	384
E. Le Breton	Do. ...	141	383
E. V. Bennett, S.A.	Do. ...	117	381
H. Harmill, N.S.W.	Do. ...	126	379
R. Jobling, N.S.W.	Do. ...	128	376
R. Jobling, N.S.W.	S. L. Wyandottes ...	111	371
J. M. Manson	White Leghorns ...	120	368
O.K. Poultry Yards	Do. ...	116	368
T. Fanning	Black Orpingtons ...	140	367
C. Knoblauch	White Leghorns ...	108	366
F. Clayton, N.S.W.	Do. ...	122	361
Geo. Tomlinson	Do. ...	128	358
R. Burns	Black Orpingtons ...	126	357
W. Meneely	Do. ...	128	357
Cowan Bros., N.S.W.	White Leghorns ...	117	354
W. Purvis, S.A.	Do. ...	136	347
E. A. Smith	Do. ...	132	346
Derrylin Poultry Farm	Do. ...	132	343
W. Parker	Do. ...	132	343
Moritz Bros., S.A.	Do. ...	123	340
R. Burns	S. L. Wyandottes ...	132	336
Cowan Bros., N.S.W.	Black Orpingtons ...	139	333
W. Lyell	White Leghorns ...	111	330
J. Aitchison	Do. ...	96	327
W. Lindus, N.S.W.	Do. ...	140	314
G. H. Turnero	Do. ...	122	308
J. Zahl	Do. (No. 2) ...	110	308
J. Zahl	Do. (No. 1) ...	136	302

Competitors.	Breed.	July.	Total.
J. G. Richter	White Leghorns ..	128	288
E. A. Smith	Black Orpingtons ..	150	282
Loloma Poultry Farm, N.S.W. ..	Rhode Island Reds ..	107	260
J. G. Gill	White Leghorns ..	116	260
E. Pocock	Do.	100	247
S. Chapman	Brown Leghorns ..	101	211
F. Clayton, N.S.W.	Rhode Island Reds ..	124	187
W. H. Forsyth, N.S.W.	White Leghorns ..	103	168
J. R. Johnson	Plymouth Rocks... ..	85	85
Totals ... .. .	...	6,563	18,695

[The above report was inadvertently omitted from the September issue of the Journal—Ed.]

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, AUGUST, 1915.

Seven thousand one hundred and seventy-six eggs were laid during the month, an average of over 135 per pen. T. Fanning's Black Orpingtons win the monthly prize with 154 eggs. The following are the individual records:—

Competitors.	Breed.	August.	Total.
Jas. McKay	White Leghorns ..	139	646
Mrs. J. Jobling, N.S.W.	Black Orpingtons ..	135	640
Mrs. Munro	White Leghorns ..	140	594
J. Gosley	Do.	140	594
C. E. Bertelsmeier, S.A.... .. .	Do.	147	575
J. D. Nicholson, N.S.W.	Do.	138	573
S. E. Sharpe	Do.	141	567
A. H. Bailey	Do.	138	567
J. M. Manson	Black Orpingtons ..	149	565
J. R. Wilson	White Leghorns ..	142	565
Kelvin Poultry Farm	Do.	143	559
King and Watson, N.S. W.	Do.	134	550
E. F. Dennis	Do.	140	543
A. H. Padman, S.A.	Do.	140	542
C. T. Clark	Do.	130	530
E. Le Breton	Do.	142	525
H. Hammill, N.S.W.	Do.	146	525
T. Fanning	Black Orpingtons ..	154	521
A. T. Coomber	White Leghorns ..	133	519
E. V. Bennett, S.A.	Do.	129	510
J. M. Manson	Do.	142	510
T. Fanning	Do.	126	510
R. Burns	Black Orpingtons ..	148	505
O.K. Poultry Yards	White Leghorns ..	135	503
W. Meneely	Black Orpingtons ..	145	502
C. Knoblauch	White Leghorns ..	133	499
E. A. Smith	Do.	151	497
R. Jobling, N.S.W.	Do.	120	496

Competitors.				Breed.	August.	Total.
R. Jobling, N.S.W.	...	...	...	S. L. Wyandottes	124	495
Geo. Tomlinson	...	...	...	White Leghorns	134	492
F. Clayton, N.S.W.	...	...	...	Do.	127	488
W. Purvis, S.A.	...	...	...	Do.	138	485
Cowan Bros., N.S.W.	...	...	...	Do.	131	485
W. Parker...	...	...	...	Do.	139	482
R. Burns	...	...	...	S. L. Wyandottes	143	479
Cowan Bros., N.S.W.	...	...	...	Black Orpingtons	144	477
Derrylin Poultry Farm	...	...	...	White Leghorns	131	474
Moritz Bros., S.A.	...	...	...	Do.	132	472
W. Lyell	...	...	...	Do.	133	463
W. Lindus, N.S.W.	...	...	...	Do.	143	457
J. Aitchison	...	...	...	Do.	115	442
E. A. Smith	...	...	...	Black Orpingtons	151	433
G. H. Turner	...	...	...	White Leghorns	124	432
J. Zahl	...	...	...	Do. (No. 2)	123	431
J. Zahl	...	...	...	Do. (No. 1)	125	427
J. G. Richter	...	...	...	Do.	131	419
Loloma Poultry Farm, N.S.W.	...	...	...	Rhode Island Reds	134	394
J. H. Gill, Victoria	...	...	...	White Leghorns	134	394
E. Pocock	...	...	...	Do.	133	380
S. Chapman	...	...	...	Brown Leghorns	117	328
F. Clayton, N.S.W.	...	...	...	Rhode Island Reds	134	321
W. H. Forsyth, N.S.W.	...	...	...	White Leghorns	125	293
J. R. Johnston	...	...	...	Plymouth Rocks	111	196
Totals	...	...	...	...	7,176	25,871

INCUBATORS.

Mr. Hindes, the Poultry Instructor at the Gatton Agricultural College, advises as follows:—

1. He uses three makes, viz.:—Stewart's Nonpareil (water), Cyphers, and Prairie State (hot-air) machines. All of these do excellent work when properly handled, and may be recommended. There are other machines which are probably equally good, but the above are those with which we have had personal experience.
2. The only advantage of the hot-water machines is that, in the event of the lamp going out, the temperature does not fall to such an extent or so quickly as in the case of the hot-air machines. Water, of course, cools far less quickly than air, the result being that the temperature of the egg chamber will be longer maintained.
3. The idea that a small incubator does not give such good results as a large one is altogether wrong. Our Poultry Expert states that the only "100-chicken" hatch he ever had was from a 60-egg Cyphers machine.

BLACK ORPINGTONS.

According to the Rev. E. W. Sturges—probably the greatest authority in England on poultry-breeding, &c.—the Black Orpingtons are the most popular fowls in the world, owing to their strong basis of utility. They serve the dual purpose of providing large birds for the table, with flesh of first-rate quality; and they are good layers of large brown eggs. They are a docile breed, easily kept within bounds; and the hens make gentle mothers. The chickens are hardy, and easily reared. Mr. Sturges remarks that it is worthy of note that in the Australian laying competitions, which extend over a period of twelve months, the Black Orpington has more than once headed the list with an average of 250 eggs to its credit. In the April (1915) Competition at the Queensland Agricultural College, Mrs. Jobling's Black Orpingtons won the monthly prize with 123 eggs. In August, 1914, T. Fanning's Black Orpingtons laid 165 eggs, which won the top score; and up to June, 1915, in the 12th egg-laying competition at the College, which began on the 1st of April, Mrs. Jobling's birds topped the list with 370 eggs for the three months, Mr. J. McKay's White Leghorns coming next with 363 eggs.

UTILISATION OF PIE MELONS.

A lady correspondent at Goodna writes, on the subject of the value of pie melons, as follows:—

“ I have found, in endeavouring to sell pie melons, that people have the idea that they can only make jam of them, and consequently do not buy, because they are too busy to use them in this way. The result was that I had a large number left on my hands; but I have not regretted it, for, although a ‘new chum,’ I thereby discovered various ways of cooking them.

“(1) *Jam*:—Cut up into dice, and sprinkle with half the sugar over night, adding lemons or rosellas, and boil next day an hour and a-half; then add remainder of sugar and boil twenty minutes. The sugar should be 1 lb. to 1 lb. of fruit. Ginger may be used for flavouring if desired; oranges as well as lemons may be used.

“(2) *Pies*:—Cut up the melon, and boil in water until soft; drain off the water, add sugar and lemon-juice or rosellas. Put a pastry crust over the fruit, and bake.

“(3) *Vegetable*:—Boil in water until soft, with salt, as for marrow.

“(4) *Pickle*:—Cut up some onions and, after they have boiled in salt and water a while, add the melon cut up. With some cold vinegar make a paste of mustard, flour, and sugar (equal quantities of each); add this to boiling vinegar and stir until it thickens; pour this over the melon and onions, well drained from the water in which they have boiled.”

Our correspondent adds—

“We tried the method for drying rosellas given in the Journal, and found it answered splendidly. I have just made some melon and rosella jam from fruit kept all the winter.”

State Farms.

STATE FARM, BUNGEWORGORAI.

MANAGER'S REPORT FOR THE MONTH ENDING 10TH SEPTEMBER, 1915.

METEOROLOGICAL.—The droughty conditions were somewhat alleviated during the latter part of August by a fall of rain which resulted in 120 points being recorded. This was supplemented by a further fall of 30 points on the 6th instant; and on Friday, the 10th, rain again was experienced, 7 points being registered. The resulting benefits have been practically nullified by the exceptionally strong drying westerly winds since experienced: that is, so far as growing crops are concerned. More especially does this apply to those late sown.

WINTER CEREALS.—The best of these will give very light yields, which is not to be wondered at, seeing that no moisture has been present in the subsoil since the removal of the last crop, and that sufficient to meet the requirements of this has not fallen during the usual growing period.

On light sandy soils where the percolation is rapid, probably some of the summer rains were not lost wholly by evaporation, as the crops growing on such situations are slightly better.

In the beginning of last month the indications were that a whole season's work would be lost. Fortunately, at present, the outlook is more hopeful and, given fair conditions, a little more seed than that sown will be garnered. This applies to the sections embodying the new crossbreds.

SUMMER CROPS.—The following have been sown to date, viz.:—10½ acres Teterita, 1½ acres Red Kafir, 7 acres Teff grass.

VINEYARD.—The warm weather has wrought a change here, and, with only one or two exceptions, the varieties have started into growth. Where possible to make observations, the indications are that a heavy crop will result under fair conditions.

CITRUS ORCHARD.—Those trees not seriously injured by the dry weather are covered with blossom, which requires more rain to make it set.

DECIDUOUS ORCHARDS.—The trees in this section, on the whole, are rather late this season, due, no doubt, to the late advent of moisture. Trellised peaches, in most instances, give promise of fair yields.

GRASSES.—The dry weather in the sections put down under "Rhodes" grass killed out a great portion of the plants; but those remaining have demonstrated their marvellous recuperative powers, having shoots at the present time over 1 ft. long (runners). It should be mentioned that this is on light sandy country.

STOCK.—Sufficient vegetation has not appeared in the paddocks to exercise any benefit on the animals depastured therein, but with another fall of rain within a reasonable period, good feed would be assured.

M. E. SOUTTER, Manager.

The Orchard.

CITRUS CANKER.

The Florida Agricultural Experiment Station has published in Bulletin 124 (issued October, 1914), three papers on the new citrus disease, which are summarised as below by the "Agricultural News" of Barbados:—

I.—HISTORY OF CITRUS CANKER: E. W. BERGER.

The realisation that a new citrus disease was present in Florida took place in July, 1913, when it was found in several blocks of grape fruit at a certain nursery. Specimens had been received from another locality a year earlier, but were supposed at that time to show merely an unusual form of citrus scab. The infections were traced partly to importations of *Citrus trifoliata* from Texas, partly to stock obtained direct from Japan. It transpired later that the disease was present in Alabama, Mississippi, and Louisiana.

An order was issued prohibiting importations of citrus plants into Florida; a fund was raised to which the Florida Growers and Shippers' Association contributed 2,000 dollars, and the Governor of Florida 1,000 dollars; and a campaign was started against the disease.

II.—STUDIES OF CITRUS CANKER: H. E. STEVENS.

Grape fruit is most severely attacked, the infection occurring on leaves, twigs, branches, and fruits; then in order of susceptibility follow *Citrus trifoliata*, and the navel and some of the sweet orange varieties, which are affected on leaves, twigs, and fruits. Scattered infections have been found on the leaves and twigs of Satsuma, tangerine, lime, and rough lemon.

The distinguishing feature of citrus canker, as observed in the field, is the characteristic spotting produced on the fruit and foliage. As usually seen, the infection appears as small light-brown spots, from less than $\frac{1}{16}$ to $\frac{1}{4}$ inch in diameter. The spots are usually round, and may occur singly, or several may run together, forming an irregular area. This last usually occurs on fruits. The spots project above the surrounding healthy tissue, and are composed of a spongy mass of dead cells covered by a thin white or greyish membrane. The membrane finally ruptures and turns outward, forming a lacerated or ragged margin around the spot.

On the leaves, infections first appear as small, watery dots, with raised convex surface. These dots are usually of a darker green than the surrounding tissue. Sometimes, however, the surface of the spots is broken as soon as they appear. Spots may appear on either surface of the leaf, but they do not at first penetrate through the leaf tissue. They gradually increase in size, change to a light brown, and become

visible on both sides of the leaf. In the older spots one or both surfaces may be bulged or raised, and such spots are commonly surrounded by a narrow yellowish band or zone. In the more advanced stages the surface of the spots becomes white or greyish, and finally ruptures, exposing a light brown spongy central mass. Old spots soon become overgrown by saprophytic fungi, and may appear pink or black on account of these fungus growths.

On the fruits, the spots are very similar to those formed on the leaves. They project and retain a circular outline. They do not penetrate far into the rind. They may be scattered over the surface, or several may occur together forming an irregular mass. Gumming is sometimes associated with the spots formed on the fruits. Canker, apparently, does not cause a rot of the fruits directly, but opens the way for other fungi to enter and cause infected fruits to rot. The spots on young twigs are like those on the leaves and fruit. On the older twigs they are more prominent, and more or less irregular in shape. This is especially true of old spots. They show the same spongy tissue as is found in the spots on the leaves, but assume a cankerous appearance, and the surface membrane completely disappears. These spots or cankers are formed in the outer layers of the bark tissue, and do not penetrate to or kill the wood. The spots once formed in the bark are persistent, and are not readily sloughed off. They may remain for a long time, and form centres from which infections may readily spread. This is confirmed by observations on infections produced on potted trees in the greenhouse, and in the grove by artificial infection. Some of these spots have been under observation for over a year, and show no tendency to slough off.

Other citrus diseases with which canker may be confused are Scab, Scaly Bark, and possibly Anthracnose. It can, however, readily be distinguished from any of these by noting the following points:—

- “1. It differs from scab in the typical round spots produced; the size of the spots, and the fact that the spots penetrate through the leaf tissue. It does not distort the leaves. There are no wart-like projections. Canker occurs on older wood, Scab does not.
- “2. Canker differs from Scaly Bark in the size of the spots, which are much smaller and more circular than those of Scaly Bark; and the spongy nature of the spots—Scaly Bark spots are hard and glazed. Canker is common on grape fruit, Scaly Bark is not. Canker forms spots on leaves, Scaly Bark does not.

“3. Canker differs materially from Anthracnose in the size of the spots, which are much smaller than those of Anthracnose. Canker spots are raised, Anthracnose spots are sunken. Canker has spots of spongy character, those of Anthracnose are hard. Canker occurs on young shoots and older twigs, Anthracnose does not.”

Experiments in which dry infected material was pinned to young healthy foliage showed that the disease was infectious. Small watery spots appeared in one month, and these had developed in two months into the spots typical of the disease. A fungus was isolated from the young spots, and afterwards identified among those present on the older spots. Infection experiments from pure culture gave positive results in two out of many instances.

The fruiting bodies of the fungus are small globular pycnidia, which exude the colourless spores in thread-like tendrils. The pycnidia are somewhat difficult to distinguish from the tissues of the spots.

The disease spreads with great rapidity in rainy weather, infection proceeds from the old spots even after these have passed through a winter.

III.—ERADICATION OF CITRUS CANKER: FRANK STIRLING.

Mr. Stirling was employed by the Growers' League to try to clear up the disease first of all in Dade County, a district in which the grape fruit industry is developing very rapidly. He tells his story very dramatically.

At the outset some 200,000 nursery trees and over 500 acres of grove trees were cut back, defoliated, and the trunks painted with Bordeaux mixture or carbolineum. “At this juncture everyone began to breathe a little easier.” As the inspection proceeded, more and more infection was found, and more and more was treated. The number of infected properties rose to nearly a hundred. Then with the new growth on the trees came the shock of finding that the work had been carried out in vain; that instead of checking the disease, the activity of the workers had actually contributed to its spread.

The next method adopted is even more heroic. A flaming spray produced by a machine “which resembles a plumber's blow-torch, only a hundred times larger,” is used to scorch the trees, the grass, and the soil beneath, until the tree is completely charred. In one district 1,933

grove trees and 101,300 nursery trees have been burned. Some fifty men are employed on the work.

When leaving one grove for another, each man changes his suit, the discarded one being disinfected with corrosive sublimate solution. No one is permitted to touch a tree.

According to Stirling, "canker is without doubt the most infectious of any known disease." A certain 4-acre grove of grape fruit trees, inspected in the first week of June, was to all appearances free of canker. Three weeks later one tree began to show a slight infection upon one limb. Four days later canker was found on five trees; in another week the number infected was twenty-seven, and there would have been no difficulty in picking fifty boxes of diseased fruit. Canker is so deadly that a tree is rendered worthless in two or three months from the time of infection.

It will be seen that the citrus canker situation in Florida is affording us the spectacle of an attempt absolutely to eradicate a disease which has already become well established, and that in a district which must always be exposed to reinfection over the land frontier of the State. The odds against success are great, but the cost of failure would be very heavy. "It would be merely a matter of months before the canker would be entirely over the orange belt." The moral for the citrus-growing islands of the West Indies is obvious.

A BANANA BEARING TWO BUNCHES.

Such a *lusus naturæ* may have been observed in Queensland banana plantations, but if so we have never heard of it. The *Bulletin* of the Department of Agriculture of Jamaica (Vol. II., No. 8, August, 1915) publishes an interesting photograph (here reproduced), supplied by the General Manager of the United Fruit Company of Jamaica, Captain S. D. List, recording this very rare occurrence.

"It would be interesting," says the editor of the *Bulletin*, "to see whether the suckers from this plant are capable of reproducing this habit as a double-fruited type of banana might prove of economic value in increasing the output of bunches from a cultivated area. The expectation is, however, that this is an accidental production and not a confirmed character of the Banana plant."



PLATE 17.—BANANA PLANT BEARING TWO BUNCHES OF FRUIT.

Tropical Industries.

PROFITABLE MANURING OF SUGAR-CANE.

From an article in the "Fiji Planters' Journal" (August, 1915), we take the following:—

A great deal of valuable work has been done in Fiji as well as in other parts of the world during recent years with the object of improving varieties of cane plant-breeding and selection; and new varieties have been evolved or discovered which promise to yield a higher percentage of sugar than various common kinds which have been hitherto widely grown.

It is really an unbusiness-like and old-fashioned policy to grow varieties of cane which yield a large tonnage per acre, but with an actual low sugar content. In the cultivation of sugar-cane, quality stands for quite as much if not more than in other business undertakings.

It is sugar that is wanted, and it is sugar really that is only paid for, for example:—

30 tons of a cane containing about 14 per cent. sugar yield $3\frac{1}{2}$ tons of sugar; 25 tons of cane containing about 10 per cent. sugar yield 3 tons of sugar.

And that is not all, for the 5 extra tons entail extra cost for cutting, additional haulage, and milling charges, besides depriving the soil of elements of fertility to no good purpose, necessitating an additional use of fertilisers to make up the deficiency.

Occasionally a heavy crop of a quick-growing variety of cane may yield more sugar on the whole than might be possible to get in the same time from a variety having usually a higher p.o.c.s., but "still" the expenses incurred in harvesting and milking it will be proportionally greater, and should not be overlooked in balancing up the account.

Howbeit, although a planter may make profit from growing a cane with a comparatively low percentage of sugar, he should never cease to aim at producing as heavy if not a heavier crop of cane with the "highest possible p.o.c.s."; and to achieve this desirable end the use of liberal supplies of manures or fertilisers will do much, particularly when suitable combinations are judiciously applied.

The water supply is an obvious controlling factor in the production of good cane fields.

No water supply can surpass the natural rain when it falls in reasonable quantities and at favourable times throughout the growing period of the cane crop. In tropical latitudes, unfortunately, the rainfall is not always exactly as is desired. Sometimes torrential downpours scour the land and beat down the cane. Sometimes the rain is too continuous,

and otherwise excellent cane soil is rendered swampy and sour, which is not beneficial to a good cane development.

In the Hawaiian Islands where the cultivation of sugar-cane has been subject to the most thorough scientific and practical investigations, and where, as the outcome of which, the average production of sugar per acre is higher than in any other cane-growing country in the world, manures costing the cane planters more than 2,000,000 dollars per annum are used, and nitrogen (mostly in the form of nitrate of soda) is the principal ingredient which constitutes by far the greatest portion in this enormous sum of money expended in a group of islands, the total area of which is 1,000 square miles smaller than the Fiji Group.

Nitrates, though of first importance in producing greater yields of sugar-cane, do not supply the probable need also of potash and phosphates. Potash has a marked influence on the carbohydrate (sugar and starch) contents of plants; and consequently, when a soil is deficient in this ingredient, it is expedient to use some sulphate of potash—say 1 cwt. to $1\frac{1}{2}$ cwt. per acre—which should be incorporated in a mixture to apply at time of planting or before ratooning.

Phosphates of themselves do not seem to increase the cane yields to anything like the extent that nitrate and potash do; still, to omit using some phosphatic manure in any manurial treatment would be most inadvisable, as these manures are comparatively inexpensive, and constitute an important factor in maintaining a soil in a necessary state of general fertility.

It is confidently believed that sugar planters in Fiji will find that it is most profitable to always employ a combination of manures containing a suitable proportion of phosphates, potash, and nitrates at the time of planting or when the ratoon crops are starting their new growth. These manure mixtures should be worked or ploughed into the soil along the rows just prior to the time when the cane begins to make its main growth.

The top-dressings of nitrate of soda should be given 1 cwt. per acre (or not more than $1\frac{1}{2}$ cwt.) at a time at intervals of a few weeks during the chief growing period. Two or three such top-dressings will probably be found sufficient and highly satisfactory.

THE MOUNT MORGAN MUNITIONS COTTON LEAGUE.

COTTON-GROWING IN AUSTRALIA: NO COTTON, NO SHELLS.

By G. STEPHEN HART, Mount Morgan.

Many attempts have been made to grow cotton in Queensland, but the trouble of picking it has repeatedly thrown it into disfavour. That it will grow successfully is well known, but it is less generally known that in 1871 Queensland exported 602,100 lb. of cotton—over 1,300 tons

weight, valued at £79,317. That was just after the American civil war. When American cotton-growing recovered, America grew much cotton, and was anxious to sell quickly, even at a low price, and this price was too small to make cotton-growing in Australia as profitable as other crops. The return was all the smaller on account of the cotton-seed being thrown away instead of forming a by-product. From time to time the Government of the day made different efforts to re-start the industry without much success. To-day, the Government guarantees to advance $1\frac{3}{4}$ d. per lb. on raw cotton, to gin it, export it, and sell it, and give any further profit obtained to the producer. On their estimated yield this should give growers more than wages. The Government do not guarantee what would be a safe minimum yield per acre, and farmers not knowing this will not venture to grow it.*

The individual farmer is not yet convinced that he could grow cotton at a profit, but now there is a national reason why he should try. Now, it is no exaggeration to say that the existence of the Empire is largely dependent on the available supply of cotton, for "no cotton, no shells" has become an accepted axiom. If ever Australia could be invaded or cut off from other lands by ocean raids we might realise to our cost, "No cotton in Australia, no shells in Australia." We have been told that a British submarine has already sunk a German super-dreadnought in the Gulf of Riga. Will it take long before submarines improve sufficiently for German submarines to sink British super-dreadnoughts? We hope it will. We hope they will never do it. But what have we to go on?

Australian cycle races were fought out on the old high "bone-shakers" until 1888, when the safety bicycle was used. In the same year Dunlop invented pneumatic tyres, but the bicycle boom did not come until 1896. This boom produced the motor cycle, and, with the powerful engines of light weight used for motor cycles, came the motor-car. Until 1896 no one could drive a motor vehicle along an English road unless preceded by a pedestrian with a red flag, and it was not until 1903 (twelve years ago) that it was thought necessary to legislate specially for motor-cars. The first motor-driven aeroplane was built in 1903, and in 1906 Santos Dumont achieved world-wide fame by flying 200 yards, for, although the Wrights had flown 24 miles the year before, their performance was not generally believed. Now, nine years later, it has been officially announced that Great Britain has 2,500 aeroplanes and Germany 2,000. Probably France has more than either. Each year they become better, and have still lighter and more powerful petrol motors. The submarine also depends upon light and powerful motors. They have

* Minimum yield in a fair season is 1,000 lb. of seed cotton per acre. In 1907 the yield ranged from 1,368 lb. to 4,250 lb. per acre.—ED. "Q. A. J."

only been tested under war conditions for twelve months, and it is quite certain they will be much improved. Whether they will be more quickly improved by Germans than by British, French, and Americans is less certain. Still, it seems more than possible that they may seriously affect the safety of our ocean communication, and we may become, temporarily at least, more thrown on our own resources to protect ourselves from outside raids. We should remember that our AE 2 travelled 30,000 miles before her end came. What will they do next year? Nine years ago Santos Dumont flew 200 yards! And no Australian cotton means no Australian shells.

In 1909 the United Kingdom imported close upon 1,000,000 tons of raw cotton, of which 732,359 tons, valued at £41,174,869, came from the United States, and 38,399, valued at £1,724,923, from British possessions. For 10,000,000 soldiers 1 lb. of cotton per man would mean about 4,500 tons. I do not know how many pounds of high explosives made from cotton each soldier, on the average, uses in one year, but as a guide it may be taken that 1 lb. of cordite is required for about 250 rifle cartridges, and 500 lb. of cotton makes one charge for one 15-in. shell for the "Queen Elizabeth." That illustrious chemical savant, Sir William Ramsay, has, with others, been asserting, again and again, that no cotton means no shells, and has at last prevailed upon the allies to declare cotton contraband of war, and that unless we have cotton in Australia we are defenceless. Shall we grow it or import it? Or shall we sit down without it till we see if anybody comes our way?

The ultimate fate of Australia is now being decided in Europe, and patriotic Australians who are fit and free to do so are hurrying there to help; but cannot those who stay behind do something? A number of fitters are to be used in Queensland to make shells. A single lathe capable of making 20 shells a day is gladly accepted. So would a contribution of 1,000 tons—or even 100 tons—of cotton. From world statistics it may be taken that 5 acres of cotton-plants yield 1 ton of ginned cotton. The yield from perennial cotton, where unaffected by frost, is as high as 5 lb. of bolls or 2½ lb. of lint per plant. As the picking necessitates considerable labour it would seem better for many to grow small areas of up to (say) 5 acres each, rather than for individuals to attempt large plantations.

We have all over Australia, women working industriously at Red Cross work for our soldiers. Individually, each one's work may seem but a drop in the ocean, but they are showing that sufficient drops make an ocean. Why should not each of the 20,000 residents of Rockhampton and each of the 12,000 residents of Mount Morgan grow one cotton-plant? Why should not each of the 600,000 residents of Queensland grow one plant? Their little contributions could be taken to the local municipal

authorities to forward to Brisbane. The Government's advance of $1\frac{3}{4}$ d. per lb. could be a good addition to our patriotic funds. But the farming community could help more largely. Many feel they cannot leave their land to become a wilderness whilst they fight a year, or two years, or three years in Europe, and many know they cannot leave their families unaided in the bush. But if they cannot give their lives they can give some of their time and energy. They can often give more time than ready cash to help the Empire. Even if there was no cash return from their cotton-growing they could do this, and cotton-growing is not unprofitable. If a man has land, let him grow some cotton, even if only a little. Let him grow what he can harvest himself or with paid labour, and then, if volunteer pickers are available, let him plant another piece to be picked by these volunteers and sent to the patriotic fund suggested above.

In these ways we should at least get sufficient cotton to help the Empire, or to help Australia if she was put to a sudden test of her internal strength, and we should all get more familiar with the cotton-growing industry, which yields its hundreds of millions worth of produce year after year. Then we should know if we could add it to our list of exports or, better still, to our list of internal manufactures.

These suggestions are put forward with the hope that they will be improved upon, and carried to a successful issue, under the guidance of those amongst us who have had many years' successful experience in cotton-growing; but we should move quickly, as seed planted in September and October or even November should produce a harvest about the close of the next European winter.

PRACTICAL SYMPATHY FOR AN ORCHARDIST AT THE FRONT.

A splendid example of appreciation of the patriotism of a vigneron at Renmark, who enlisted in the Commonwealth Military Reserve Forces, was afforded by his fellow orchardists in September last. No less than sixty volunteers answered the call of the Renmark Agricultural Bureau to prune Reservist Starke's vineyard on Saturday afternoon, 12th September. Some had been at work the previous Saturday, and a few that morning, and the crowd in the afternoon very soon had the 5 acres of currants, malagas, and sultanas pruned clean, rods tied up, and cuttings raked off the ground. The erection of a row of trellis was also included in the afternoon's work. Arrangements were made for ploughing the land by volunteer teams and labour on the following Saturday, and Mr. Barge, who is looking after his brother-in-law's property during his absence, reckons to manage all right now till harvest. Private Starke was the first man to leave Renmark at the call to arms, and he is so far the only married man from this settlement with the troops in Europe. His grape crop was harvested by voluntary labour in the summer, and the house which he left half built has been pretty well finished off by unpaid labour and a donation from the Renmark Patriotic Fund.

Entomology.

CONTROL OF THE CANE BEETLE.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report from Mr. E. Jarvis, Entomologist to the Bureau:—

Studies relating to the control of our common Cane Beetle (*Lepidiotia albohirta*) during its grub stage are being continued, experimentation having for the most part been confined to the trial of various poison-baits.

This interesting branch of research will be carried on as long as possible, but may have to be abandoned shortly, as the majority of larvæ will soon be pupating, and in some districts have already gone down out of reach of the plough.

Prevailing dry conditions have forced cane grubs to penetrate into the ground more deeply than usual to obtain a sufficiency of moisture, and at present in localities where the soil is of a light nature it appears likely that the beetles may make an exceptionally early emergence this season.

Perfectly developed adult forms of *albohirta* are often found below ground in their pupal chambers patiently awaiting the occurrence of certain conditions of temperature and moisture conducive to a general emergence of the pest.

Odd specimens may be dormant in this way for two or even three weeks, and in abnormally wet seasons when grubs pupate near the surface have been ploughed up as early as the middle of October. It may be of interest to note that an adult specimen of *albohirta* was found in dark volcanic soil at "Green Hills" on the 28th of July, the earliest previous record of the kind at the Laboratory being 14th October, 1913.

Towards the end of July I was instructed to proceed to Mossman to attend a conference of the Australian Sugar Producers' Association, and prepare a paper reviewing the work instituted at Gordonvale Experiment Station during the past ten months.

The reading of this paper was followed by a discussion having reference mainly to the complex question of Natural Control and the possibilities of our being able to artificially enlarge its sphere of usefulness.

Speaking of predacious insects, it was pointed out that action in this direction was not always advisable in the case of indigenous species, owing to the repressive influence exercised by their hyperparasitic and other foes.

I have already stated in a previous report that knowledge of this fact need not necessarily cause us to wholly neglect such methods, or regard them as being invariably beyond our control. It is not unreasonable to assume that in a vast territory like Queensland supporting a

great variety of useful insects inhabiting widely separated districts, we might be able in some cases to derive assistance from the introduction of useful native species of local occurrence, provided they were transferred from considerable distances and without their hyperparasites and other natural enemies.

As an instance in point it may be mentioned that a chalcid parasite of our formidable sheep-maggot flies, discovered by the writer in Central Queensland on 10th October, 1913, is at present extensively bred at the Brewarrina Laboratory, and has already been distributed to sheep stations in many parts of New South Wales, where it is considered to be a very important factor in reducing the numbers of these destructive blow-flies.

Allusion was also made at Mossman to the matter of proposed importation from other countries of such useful insects as the "digger-wasp" (*Tiphia parallela*), a well-known enemy of various Scarabacidae closely related to our cane beetles. With further reference to this parasite it may be well to mention that before introducing it into Queensland it would be necessary to take steps to ascertain if our soils and other important conditions resemble those obtaining in localities where the insect occurs naturally or has been successfully established. These investigations would have to be conducted by a capable entomologist, who, in the event of finding normal conditions practically alike in essential particulars, would then collect a large quantity of *Tiphia* cocoons, pack them suitably, and forward same to Australia in cold storage.

Other matters were discussed, one of which referred to the apparent scarcity of grubs in certain districts owing to causes unknown. We hope to find time to investigate cases of this kind which may afford some clue of considerable value.

In many instances, however, such immunity may reasonably be attributed to unsuitability of the soil, or the absence of food plants of the beetle in the vicinity of plantations, or possibly to a natural non-occurrence of the pest due to the presence of adverse climatic or other influences.

CANE BEETLES AND ARTIFICIAL LIGHT.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report from Mr. E. Jarvis, Entomologist to the Bureau:—

As a result of certain field experiments conducted during November and December last, acetylene light was proved to be very attractive to both sexes of our principal cane beetles throughout their aerial existence, such reaction, however, being considerably influenced by various meteorological and other conditions.

The movements of the beetles whilst flying near artificial light were studied, particularly their manner of approaching the trap and behaviour when within a foot or so of the flame; and certain conclusions were arrived at regarding the kind of design most likely to produce a serviceable light trap, and the conditions under which the latter might be expected to yield payable results. As an outcome of these observations it is proposed to construct an entirely new form of trap for trial during the coming season. Such contrivances usually aim at

capturing the insects by means of a shallow tray or pan containing water and kerosene placed under a strong lamp. This principle, however, is not to be commended in the present instance for the following reasons:—In the first place, it entails needless labour and expense, which, although small, would nevertheless be appreciable when dealing with a number of traps; secondly, it would destroy a certain proportion of useful insects, both parasitic and predaceous, which help to control not only the cane beetle in question, but a number of other insect pests of sugar-cane.

In this connection I may mention that a well-known enemy of cane grubs (*Dielis formosus*), the common "Digger Wasp," and probably beneficial Cockroach (*Ellipsidion pellucidus*, Brunn.), which frequents the foliage of sugar-cane are susceptible to the influence of artificial light. An arboreal species of earwig also, which I believe to be predaceous on small Lepidopterous larvæ of at least one of our cane pests, is attracted in great numbers.

The grey-backed Cockchafer (*Lepidota albohirta*) responds to the stimulus induced by acetylene light from a considerable distance, the phototropic influence being wellnigh irresistible, and compelling this insect to advance towards the trap. It rarely flies directly into the flame, but when within a few yards approaches in an erratic manner by a series of short flights, settling at brief intervals on the ground or on cane plants, and, finally, as though struggling against the attractive force, plunging headlong downwards at a distance of about 1 ft. or 18 in. from the light. Our new trap will be fitted with a landing stage designed to take advantage of the above habit, and immediately capture all beetles that may settle or fall upon it, and deposit them in a large chamber from which return will be impossible. Suitable exits will, of course, be provided for useful insects such as Carabidæ (predaceous ground beetles) and the various hymenopterous parasites.

The light will be protected in such manner as to throw beetles that may attempt to dash into it on to the stage below to their certain doom, but at the same time prevent the destruction of beneficial species.

By making use of a discovery relating to a peculiar habit connected with the flight of this insect when taking to wing, it will be a simple matter to prevent cane beetles from flying out of the trap.

Recent experiments with regard to the control of *Lepidota albohirta* whilst in its larval form have for the most part given negative results, but, although apparently inconclusive, such work in reality serves a useful purpose by directing investigations into more and still more promising channels, which, owing to this gradual process of contraction, must eventually come to a focus somewhere, and in all probability reveal a pathway to discoveries of decided economic value.

Whilst stationed at Gordonvale, I have sought to embrace present opportunities for studying the life history and economy of many insect pests of sugar cane, the majority of which, although of minor importance, include a few decidedly injurious species and several hitherto undescribed forms. Such knowledge is essential to a comprehensive survey of the cane-grub problem, it being, of course, quite possible to advocate control methods that, whilst successful against one kind of pest, may destroy certain natural enemies of another, and so tend to favour an abnormal increase of the latter species.

Botany.

ILLUSTRATED NOTES ON THE WEEDS OF QUEENSLAND.

BY J. F. BAILEY AND C. T. WHITE.

No. 1.

ON THREE CLOSELY ALLIED WEEDS—*ASTER SUBULATUS*, Michx.; *ERIGERON CANADENSIS*, Linn.; AND *ERIGERON LINIFOLIUS*, Willd.

As there has been confusion for some time past in Queensland between the two weeds *Aster subulatus* and *Erigeron canadensis* (Canada Fleabane), it has been deemed advisable to prepare this series; ray florets 20-30 scarcely exceeding the pappus, more numerous. A description and figure of the closely allied *Erigeron linifolius* (Rag Weed) is given for comparison.

ASTER SUBULATUS, Michx.

Annual, glabrous; stems paniculately branched, flexuous above, 1-6 ft. high, slightly angular. Stem leaves linear-lanceolate, acute, entire, sessile by a broad or slightly clasping base, 2-10 in. long, 1-8 lines wide, those of the branches very small and subulate. Flower heads numerous, 3-5 lines broad; involucre campanulate or at length hemispherical, the bracts linear-subulate, green, imbricated in 3 or 4 series; ray florets 20-30 scarcely exceeding the pappus, more numerous than the disk florets. Achenes compressed, minutely pubescent.

This North American plant has for some time passed in Queensland as a glabrous form of *Erigeron canadensis*; but on going fully into the matter we have determined it as above. It is very abundant in cultivation paddocks and waste places about towns in Queensland. In New South Wales and Victoria it has been recorded as *Aster dumosus*, Linn, but J. H. Maiden and E. Bêche, in a note in Proc. Linn. Soc. N.S.W., vol. 24 (1909), p. 363, record it as *Aster subulatus* Michx., after referring specimens to H. L. Fernald, a well-known authority on North American plants.

Although the plant is a very common weed here, we know of no local name applied to it.

CANADA FLEABANE.

ERIGERON CANADENSIS, Linn.

Annual, hispid-pubescent or glabrate; stems usually much branched; 3-10 ft. high. Lower leaves elongate-spathulate, entire or toothed, 1-4 in. long, stem leaves linear and mainly entire. Flower-heads small and very numerous, peduncles slender; involucre campanulate, the bracts narrow, acute, about 2 lines long; ray florets numerous,



PLATE 19.—ERIGERON CANADENSIS, *Linn.*



PLATE 20.—ERIGERON LINIFOLIUS, Willd.

scarcely exceeding the involucre, more numerous than the disk florets. Achenes very small.

This North American plant—now widely spread in warm and temperate countries—has lately established itself as a weed in several places in Southern Queensland, and has become especially abundant in the Nerang and Coomera districts.

RAG WEED.

ERIGERON LINIFOLIUS, Willd.

A coarse erect annual, several feet high, clothed with long soft hairs or shortly scabrous-pubescent. Radical leaves petiolate oblong, often coarsely toothed, stem leaves sessile, entire or remotely toothed, often above 2 in. long. Flower-heads rather small, pedunculate; involucre broadly ovoid or almost hemispherical, the bracts narrow, acute in 2 or 3 series; female florets very numerous shorter than the pappus, the outer ones usually dilated at the tip into a minute ligula; disk-florets few. Achenes small, pubescent.

A common tropical and sub-tropical weed indigenous in Queensland, generally known as "Rag Weed," but in some places as "Cobblers' Pegs"; this sobriquet is now, however, more commonly applied to *Bidens pilosa*.

Eradication—All these species being annuals, to effectively eradicate, the plants must be prevented from seeding.

STOOLING PROCLIVITIES OF WHEAT.

Experiments comparing the yields of individual varieties per single grain sown have not been carried out by the Department, the usual course being to plant up larger areas of land so that field tests may be carried out under ordinary field conditions. The stooling proclivities of different wheats vary to a considerable extent. Winter wheats, when fed off or kept in check, have a tendency to throw out a large number of stems, possibly 50 in number. On the other hand, quick-maturing wheats rarely throw out more than three or four stems, unless fed over. It will thus be seen that comparisons as to the stooling habits of different wheats are not always an indication of their value for grain purposes. Of the three varieties—Golden King, Hermitage, and Cleveland—the two former are mid-season, moderate stooling varieties, whilst the latter usually takes a longer period to mature and stools more heavily. The name Golden King is synonymous with Gluyas Early. The heaviest stooling wheats referred to above—*e.g.*, Winter Wheats—belong to the Manitoba and Fife families. Other wheats with the same characteristics are commonly grown in cold countries.

Vegetable Pathology.

EXPERIMENTS WITH POISONOUS SPRAYS FOR THE DESTRUCTION OF WEEDS AT THE SUGAR EXPERIMENT STATION, MACKAY.

Some time ago it was promised that the Sugar Bureau would undertake experiments with arsenical sprays for the purpose of determining whether weeds could be successfully and economically destroyed. In the composition of the sprays used it was determined to follow the experience of other countries, and accordingly two mixtures were made up.

The first solution was made up as follows:—

8 lb. arsenic and 2 lb. caustic soda were mixed together in the dry state, and water slowly added until dissolved. Sufficient heat was generated to bring the mixture to almost boiling point. This was then made up to 5 gallons, and for use was diluted to 300 gallons.

The second solution was made in the same way as the first, but about 40 oz. of washing soda was added.

The Chemist in Charge of the Experiment Station at Mackay (Mr. L. C. McCready) states:—

The experiments were divided into two series, as follows:—

SERIES No. 1.

Sprays used on growing cane with a view to testing their effects on the destruction of weeds, and also to determine whether their use had an injurious effect on the growing cane.

SERIES No. 2.

Sprays used on open headlands solely with a view to the destruction of weeds and grasses.

No. 1. SERIES.

1. All ground between cane drills on inside and half the space on the outside received a fortnightly spraying at the rate of approximately 75 gallons to the acre. Great care was exercised in this case that the cane itself received none of the spray.

2. This section received the same treatment as the first section, with the exception that the No. 2 Spray formula was used.

3. This section received a spraying with No. 2 Spray formula at the same rate as Nos. 1 and 2; but in this case the cane was also sprayed around the bottoms.

No. 2 SERIES.

In this series two portions of headland were sprayed as under, using the same quantity per acre as in the first series:—

1. Sprayed with No. 1 Spray formula solution.

2. Sprayed with No. 2 Spray formula solution.

The spraying was at first carried out every fortnight; but, as this made little or no impression on the grass, the application was increased to a weekly spraying.

RESULTS.

The results in No. 1 Series cannot be taken as conclusive, for the reason that when the experiment was first started the cane was well advanced in growth, and as a consequence soon reached a stage where it was impossible to walk between the rows with a spray outfit. The cane having closed-in rows, many of the softer grasses perished naturally by the exclusion of sunlight. It is, therefore, a debatable point whether the dying of some of the weeds should be attributed to the above factor or to the effects of the sprays. No positive conclusion can, therefore, be drawn from this series until the experiment is again tried on cane of younger growth.

The following notes have been made, although from the reasons stated above they must not be taken as positive:—

SECTION 1.

Weeds such as pig weed, billy-goat weed, and red asthma were destroyed almost on the first spraying, whilst grasses such as couch and crow'sfoot, beyond a slight yellowing during the first few days after spraying, soon recovered and grew as robustly as ever. Summer grass and mystery grass in some cases were killed, and in others survived.

SECTION No. 2.

The results in this section were identical with those found in the first section.

SECTION No. 3.

The effects of the spraying on this section with reference to weeds and grasses were identical with the former two sections. With regard to its effect on the cane, no real damage has been done, the cane having at the present time survived and thrown off any apparent injury.

A day or two after spraying, the leaves and bottom of the stool present a very withered and burnt looking appearance. In one or two individual cases where the spray reached into the heart of the cane sucker or shoot, the leader has been burnt out and the cane killed. According to the writer's mind, the wilting and burning of the leaves cannot fail to have anything but a prejudicial effect on the growth and vitality of the crop—first by limiting transpiration on account of the wilting of its foliage; and, secondly, by the set-back to growth, and the subsequent struggle rendered necessary to throw off the ill effects and re-establish growth.

SERIES 2.

In this case both sprays have given equal results, and have been successful in destroying all weeds, with the exception of couch grass and crow'sfoot grass. The couch at first appears wilted, but soon overcomes the effects, and three or four days after spraying has again established itself. With reference to star grass, the effects of the poison to date has failed to kill it. The individual plants are, however, very small and stunted in appearance, and there is no doubt that eventually the grass would succumb to the poisons.

The cost of material and labour amounted to £1 17s. 7d. per acre for work amongst cane rows, and £1 0s. 7d. per acre for headlands, for one spraying only.

Commenting on the above, the General Superintendent considers the growth of weeds to be too great at certain seasons of the year on our Northern canefields to be economically dealt with by means of arsenical spraying. In the red soils of Childers and Isis, where weeds do not grow to any extent, the work might be done at a considerably lower cost, and this land is similar to the Hawaiian lands where spraying was cheaply carried out.

Statistics.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF JULY IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING JULY, 1915 AND 1914, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	July.	No. of Years' Records.	July, 1915.	July, 1914.		July.	No. of Years' Records.	July, 1915.	July, 1914.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
	In.		In.	In.		In.		In.	In.
Atherton ...	0·89	13	0·40	0·39	Nanango ...	1·76	27	1·20	1·29
Cairns ...	1·14	27	3·18	0·35	Rockhampton ...	1·58	27	0·02	0·08
Cardwell ...	1·39	27	0·88	0·25	Woodford ...	2·73	27	1·19	2·46
Cooktown ...	0·83	27	1·91	1·47	Yandina ...	2·77	21	2 02	2·41
Herberton ...	0·57	27	0·22	0·37					
Ingham ...	1·50	22	0·71	0·90					
Innisfail ...	4·13	27	5·79	1·27					
Mossman ...	1·54	5	3·07	0·81	<i>Darling Downs.</i>				
Townsville ...	0·50	30	0·14	0·08					
					Dalby ...	1·84	27	1·48	1·24
<i>Central Coast.</i>					Emu Vale... ..	1·50	17	2·38	1·12
Ayr ...	0·49	27	0·45	Nil	Jimbour ...	1·86	24	1·54	1·23
Bowen ...	0·67	27	Nil	Nil	Miles ...	1·69	27	1·99	1·94
Charters Towers ...	0·47	27	0·61	0·48	Stanthorpe ...	2·04	27	1·12	1·02
Mackay ...	1·34	27	1·72	Nil	Toowoomba ...	2·06	27	2·38	1·76
Proserpine ...	0·94	11	1·14	Nil	Warwick ...	1·83	27	2·97	0·97
St. Lawrence ...	1·26	27	0·10	0·03					
					<i>Maranoa.</i>				
<i>South Coast.</i>					Roma ...	1·40	25	0·82	1·04
Biggenden ...	1·39	14	1·09	0·41					
Bundaberg ...	2·20	27	1·03	0·62	<i>State Farms, &c.</i>				
Brisbane ...	2·31	64	1·74	2·03	Gatton College ...	1·54	14	1·25	1·00
Childers ...	1·76	19	1·64	0·99	Gindie ...	1·23	13	0·38	0·35
Crohamhurst ...	2·85	20	2·16	2·61	Kamerunga Nurs'y	1·35	23	2·71	0·55
Esk ...	2·11	27	1·12	0·88	Kairi ...	0·49	3	0·50	0·58
Gayndah ...	1·65	6	0·58	0·55	Sugar Experiment				
Gympie ...	1·97	27	1·66	1·36	Station, Mackay	1·36	16	0·94	Nil
Glasshouse M'tains	2·65	6	1·54	2·52	Bungeworgorai ...	0·73	3	0·66	1·18
Kilkivan ...	1·87	27	0·95	1·58	Warren ...			Nil	0·13
Maryborough ...	2·13	27	1·60	0·68	Hermitage ...	1·49	7	3·17	0·78

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for July this year and for the same period of 1914, having been compiled from telegraphic reports are subject to revision.

This return was inadvertently omitted from the September issue of the Journal.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF AUGUST IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING AUGUST, 1915 AND 1914, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Aug.	No. of Years' Records.	Aug., 1915.	Aug., 1914.		Aug.	No. of Years' Records.	Aug., 1915.	Aug., 1914.
<i>North Coast.</i>	In.		In.	In.	<i>South Coast—continued:</i>	In.		In.	In.
Atherton	0·91	13	Nil	1·18	Nanango	1·55	27	1·42	0·18
Cairns	1·48	27	0·06	4·93	Rockhampton ...	0·97	27	0·41	Nil
Cardwell	1·16	27	Nil	1·19	Woodford	2·05	27	1·22	0·89
Cooktown	1·28	27	0·23	7·22	Yandina	2·18	21	0·90	1·73
Herberton	0·65	27	Nil	1·10					
Ingham	1·44	22	0·04	0·54					
Innisfail	5·30	27	0·43	10·53					
Mossman	1·58	5	0·34	2·36					
Townsville	0·40	30	0·53	0·03					
					<i>Darling Downs.</i>				
<i>Central Coast.</i>					Dalby	1·26	27	1·18	0·39
Ayr	0·40	27	0·38	Nil	Emu Vale	1·36	17	1·72	0·17
Bowen	0·68	27	0·51	0·09	Jimbour	1·41	24	2·25	0·37
Charters Towers ...	0·44	27	Nil	Nil	Miles	1·23	27	1·51	Nil
Mackay	1·19	27	0·88	0·32	Stanthorpe	1·72	27	1·60	0·31
Proserpine	0·77	11	0·99	2·13	Toowoomba	1·89	27	1·54	0·44
St. Lawrence	1·15	27	0·40	0·28	Warwick	1·59	27	1·66	0·15
<i>South Coast.</i>					<i>Maranoa.</i>				
Biggenden	1·27	14	1·82	0·44	Roma	1·04	25	1·45	Nil
Bundaberg	1·56	27	1·31	0·36					
Brisbane	2·27	64	1·60	0·29	<i>State Farms, &c.</i>				
Childers	1·33	19	0·48	0·84	Gatton College ...	1·49	14	1·62	0·25
Crohamhurst	2·37	20	1·86	2·07	Gindie	0·74	13	1·29	Nil
Esk	1·75	27	1·99	0·24	Kamerunga Nurs'y	1·54	23	0·05	3·49
Gayndah	1·22	27	1·32	0·16	Kairi	0·81	3	Nil	2·24
Gympie	1·65	27	1·47	1·31	Sugar Experiment				
Glasshouse M'tains	1·72	6	1·45	1·13	Station, Mackay	0·84	16	1·05	0·21
Kilkivan	1·42	27	1·23	Nil	Rungeworgorai ...	0·40	3	1·20	Nil
Maryborough	1·59	27	1·21	1·62	Warren	0·12	3	0·18	Nil
					Hermitage	1·90	7	1·98	Nil

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for August this year and for the same period of 1914, having been compiled from telegraphic reports, are subject to revision.

RATION FOR A BULL.

Mr. J. C. Brünnich, Agricultural Chemist, in reply to a correspondent, gives the following complete ration for fattening a bull for show purposes:—

Sugar-cane tops require to be fed at the rate of 50 to 60 lb. daily per 1,000 lb. live weight, if the ration is balanced by the addition of 2 lb. of bran and $\frac{3}{4}$ lb. of linseed meal for every 20 lb. of chop-chop. Should the ration be found to be too laxative, the bran can be replaced by an equal amount of crushed corn for a time.

If possible, the above ration should be supplemented by a little bush hay.^c

General Notes.

QUEENSLAND AGRICULTURAL COLLEGE.

BURSARIES.

An Examination will be held on the 14th December next in Brisbane and elsewhere, according to where the candidates reside, for Four (4) Bursaries at the Queensland Agricultural College, tenable for three years. Candidates must not be less than 15 or more than 18 years of age on the 1st January, 1916. Nominations close on the 16th November, 1915. Further particulars can be obtained upon application to the Under Secretary, Department of Agriculture and Stock, Brisbane.

THE NORIT PROCESS OF MANUFACTURING WHITE SUGAR.

The "International Sugar Journal" contains an account of a lecture by Dr. A. Wijnberg on "The Norit Process of Manufacturing White Sugar." In this process it is claimed that the colouring matter of the juice is removed by means of so-called 'decolourising carbon' (manufactured under the name of Norit) in the same manner that this is effected by animal charcoal in the sugar refinery. This substance has already been successfully employed for bleaching purposes in various industries, but hitherto has not been used in sugar works, partly on account of its cost and partly because a method of regenerating was not known.

It is now found that the decolourising colour of Norit can be very largely restored by boiling for fifteen minutes with a 3 per cent. solution of caustic soda.

Norit is stated to exert its decolourising action on slightly acid sugar solutions, the colour being only slightly or not at all removed when the solution is alkaline. The author explains this action by reference to the properties of colloids of the nature of pectin which are transformed into larger molecular groupings in feebly acid solutions, but into smaller ones in alkaline. The larger molecular groups are held by the decolourising carbon, while the smaller ones are not.

It is claimed that the decolourising power of Norit is about twenty-five times greater than granular animal charcoal. Its decolourising power is relatively greater in dilute sugar solutions as compared with concentrated ones; hence it is recommended to use Norit to bleach the juice rather than syrup. Norit is stated to possess the advantage of removing pectins and gums from sugar solutions, so that juice decolourised by this means is more easily filtered.

A continuation of the article is promised, in which the practical results obtained in certain factories and refineries will be considered.

TANNING SKINS.

The Sydney "Town and Country" gives the following as a "lightning tanning process":—

The lightning or sulphuric acid process is the quickest method of tanning wallaby, rabbit, and other skins, and is a very simple one. Pour five or six quarts of boiling water over two quarts of bran, and then strain the infusion. Make an equal quantity of salt water, by adding to blood-warm water as much salt as will dissolve. Mix the bran and salt water, and to each gallon of the mixture (when no more than lukewarm) add an ounce of sulphuric acid (H_2SO_4). Immerse the skins in the liquor, stirring them occasionally till tanned, which will be in about twenty minutes. When tanned, rinse in clean water, and hang out in shady place to dry. Pull and stretch them well while drying. By sufficient pulling they can be made quite white. Dry skins should be soaked in warm water before tanning till they are quite soft, and all flesh and grease should be well cleansed from them.

DESTROYING BOX AND SANDAL WOOD SUCKERS.

Mr. H. C. Quodling, Director of Agriculture, advises:—

"Round leaf box is always a difficult class of timber to kill owing to its predisposition to throw up suckers from surface roots, or after ring-barking, and more so when the operation is carried on at the wrong time of the year. The sap must be active. April and May are the months during which ring-barking will be generally satisfactory. Grubbing or cutting down suckers represents a good deal of work, but many persons are prone to grub effectively as the surest course, rather than risk cutting down the suckers, and the splitting of the butt simultaneously, to be followed by the application of arsenical solution.

"Strong plant poison is made up by boiling 2 lb. of arsenic and 1 lb. of caustic soda for an hour in 2 gallons of water—make up to 2 gallons with boiling water. Use a watering can after removing the rose. The spout should be plugged to allow the liquid to ooze out and be absorbed into the split butt."

THE QUEENSLAND COTTON CROP.

Arrangements have again been made by the Department of Agriculture to handle the cotton crop throughout Queensland. The farmers will receive an advance of $1\frac{3}{4}$ d. per lb. on all cotton in seed delivered in Brisbane. The Officers of the Department will gin the cotton and dispose of the clean lint, and if there should be any net profit, after paying all expenses, the amount will be handed over to the grower. It is further announced that the Department will supply suitable seed to any intending grower of cotton, free of cost, and will pay railway freight to the station nearest to the applicant's farm. Seed will be available early in October.

PRICKLY-PEAR IN EGYPT.

The accompanying photograph of a prickly-pear plantation at Heluan, in Egypt, is interesting as indicating that the Egyptians use the plant as food for stock, where, possibly, there is a scarcity of other fodder. The photograph was taken by an officer of the British forces



PLATE 21.—PRICKLY-PEAR PLANTATION IN EGYPT.

in Egypt. He did not know, or did not state, what use was made of the plant; but it could only be used as fodder, or for the fruit. We have seen, at Cairo, baskets of prickly-pear fruit for sale in the market. Heluan is a place on the Nile, about 16 miles south of Cairo.

TO KEEP FLIES FROM HORSES' EYES.

The skin around the eyes should be painted daily with the following dressing:—

Spirits of tar, 1 oz.; olive oil, 5 oz.

TO DESTROY ZAMIA PLANTS.

Mr. J. F. Bailey, Government Botanist, says that the usual mode adopted for killing the plant is to chop a notch in the trunk and then bore a large hole from the notch to the centre of the pith. The hole is filled with arsenic, and the plant soon dies.

USEFUL MEDICINES ON THE FARM.

As regards medicines for horses, &c., the most useful on a farm are—Raw linseed oil, turpentine, and baking soda, the dose for a horse being 2 oz. turpentine, 1 pint linseed oil, and 2 oz. baking soda. In severe or doubtful cases the services of a qualified veterinary surgeon, if available, should be requisitioned.

NON-GERMINATION OF PINEAPPLE SEEDS.

With regard to pineapple seeds failing to germinate, Mr. C. Ross, Instructor in Agriculture, states that pineapple seed should be planted immediately after being taken from the fruit. The seed germinates very irregularly, and it is usual for many misses to occur. If sown in light, well-drained loam, properly shaded and watered, a fair proportion should result. There is no secret in raising pineapple seed, and Mr. Ross is at a loss to account for failures.

HOW TO COOK VEGETABLES.

First of all, the vegetables should be thoroughly cleansed. If fresh gathered and perfectly free from insects and dirt, vegetables preserve their colour in boiling much better when not previously wetted. If blighted, or in any respect dirty, remove all that can be removed before wetting—that is, trim away the outside leaves and roots, leaving no more than is to be actually boiled and eaten. This applies to cabbage, broccoli, and cauliflowers. Having carefully trimmed them, let them lie an hour or more in a pan of spring water and salt. Observe to plunge them into the water, not to pump or pour water upon them, which would make them flabby. Immediately before putting them into the saucepan, take them out of the water and shake them well in a colander or thin straining cloth that every drop of cold water may run off. In trimming vegetables do not be too saving; one tough outside leaf will spoil a whole dish; strip till you come to tender quick-grown leaves; and in cabbages shave the stem and also the stalks of the outer leaves. Salad and radishes should be washed in water without salt. Celery requires half an hour or more to soak. A brush, somewhat resembling a plate brush, is very useful in cleaning the root end of the celery.

Green peas, French beans, and broad beans require no washing. They should be cut or shelled just before boiling. It sometimes, however, happens to suit to shell peas an hour or two earlier; if so, they should be covered with the shells, and placed on the stones or bricks in a shady room.

Asparagus, if quite fresh, need not be washed; tie them with bass or tape, in bundles of twenty-five or thirty each, making all the heads lie level, and cut the stalks to an equal length.

Turnip greens, if cleanly gathered and carefully trimmed, need no washing. Only the hearts and stems are to be used. The latter should be skinned. But turnip greens grown on sandy land, especially after heavy rains, require to be washed in several waters.

Spinach should be picked leaf by leaf, and washed in several waters, and afterwards thoroughly drained.

The stalks of white beet for boiling, as well as those of rhubarb for pies or puddings, should be skinned.

Red beetroots should be well washed and scrubbed, but not scraped with a knife, as that would discharge the rich juice and the bright colour. Potatoes and Jerusalem artichokes should be scrubbed with a birch broom or scrubbing-brush and washed very clean, just before boiling. They should not be wetted at all till they are about to be used. Carrots and parsnips should be well scrubbed and washed. After boiling, rub off the skins with a coarse cloth. New potatoes are done in the same manner. In spring, when potatoes become old and specky, it is better to peel them raw, carefully removing the specks. This must be done with a knife. Afterwards rinse the potatoes, and either steam them or boil for mashing or for browning under meat.

Onions, Leeks, and Shalots.—Take off as many coats of the skin as are at all slimy or tough. For roasting onions should not be skinned or washed, but merely wiped from dust. Young spring onions are served with the green tops, merely the roots and one thin skin being removed. Artichokes should be soaked an hour or more before boiling.

Now, with regard to dressing vegetables, one general set of rules may serve for all green vegetables. 1. A tin saucepan that shuts close, large enough to allow plenty of water. 2. The water fast boiling the moment of putting in the vegetables, but not having boiled before nor been allowed to stand on the hob. The quicker the water comes to boil at first, and again when the vegetables are put in, the sooner they become tender, and the better they preserve their colour. 3. A brisk fire that will cause the water to boil up again quickly. 4. A small quantity of common salt to be put in with the vegetables—not before. A tablespoonful of salt is sufficient for a large dressing of greens; half that quantity for peas. 5. The instant the vegetables are put in shut the lid close, and do not lift it up again until it is forced up by rapid boiling; when this is the case, remove it, and do not return it again. 6. When the vegetables are nearly done, have quite ready a colander and slice or wire ladle with which to take them up; do not pour the water through them, but carefully lift them out with the ladle into the colander. 7. Shake them carefully in the colander to drain before putting them into the vegetable dish. Spinach should be pressed between two trenchers.

N.B.—The boiling of green vegetables may be expedited, the colour preserved, and if they are old and tough they may be made tender by putting in with them a small quantity of soda, half a teaspoonful of carbonate of soda, or a bit of washing soda the size of a small hazel-nut, is enough for a moderate dressing. This is not suitable for potatoes or roots in general; it spoils their colour, though it improves that of greens.

Answers to Correspondents.

TO SMOTHER COUCH GRASS.

In reply to a correspondent making inquiries on the subject of a suitable crop to smother couch grass, Mr. H. C. Quodling, Director of Agriculture, advised in August, as follows:—

“Panicum is probably the quickest growing crop for the purpose. Some trials carried out at the Agricultural College when there was a plentiful supply of moisture and warmth, a crop of panicum matured in seven weeks from the date the seed was sown, and gave a return equal to 8 tons of green fodder per acre. It may be pointed out that everything was in favour of this crop, particularly in the matter of preparation of the land, which had been lying fallow for some time previously. Siberian millet is not as quick a grower as panicum, but it spreads and stools to a greater extent. Japanese millet can also be recommended as a smothering crop, but it must be understood that all of these varieties revel in heat and moisture, and at this time of the year it is unlikely that you will get the same growth and progress as in the rainy season. Cowpeas (black for preference) are favoured as a smothering crop for couch, but it is not to be expected that they will get ahead of the grass unless the latter is kept well in check before planting time. Couch destruction is brought about effectually by shallow cultivation during the warm weather, keeping the grass on the surface, and knocking it about with implements to expose the roots to the drying action of the sun.”

SEED OF A GRAFTED ORANGE.

“Orchardist,” Wolvi, Gympie—

Your question as to whether the seed of a grafted orange will produce fruit, or go back to the original stock on which the scion was grafted, was submitted to the Director of Fruit Culture, Mr. A. H. Benson, who states that the seed from a grafted orange tree, if sown, will produce an orange, not necessarily, however, of the same type as its parent, as there is always the danger of inoculation by bees or other insects. It is not possible for the seed of an orange mated, say, on a lemon or citron stock to produce a lemon or citron. Copies of Mr. Benson's Bulletin on Citrus Culture and Pineapple Growing have been forwarded to you, and in them you will find answers to the questions on which you desire information. It would certainly be advisable to have the soil analysed. Directions for the collection of samples and scale of fees payable have been also sent to you. Send the samples of soil to the Agricultural Chemist, Department of Agriculture and Stock.

The planting seasons for Citrus fruits in the Southern coast districts are from May to August, and again in February. It is not too late to plant during this month (September) if the weather should prove favourable.

DESTRUCTION OF ANTS.

We frequently receive letters asking for a remedy against ants of all kinds. With a view to satisfying inquiries we published in the issue of this Journal for November, 1913, several remedies more or less effective in dealing with the most common varieties of ants. These were:—

DESTRUCTION OF ANT HILLS.

As the hot weather approaches, those pests of the State, ants of all sorts and descriptions, become lively, and begin to infest house and field. Then, on all sides, the question is heard: "How can we get rid of the ants?"

In the case of the extensive "antdoms" of the blue meat ant, a good way to exterminate them is to cover the gravelly nests with weed chippings from the garden. This proceeding appears greatly to trouble the insects, probably because the dry weeds prevent them from safely depositing the quantities of small stones and gravel they carry up from below the surface of the soil.

Failing this remedy, the best method of dealing with these ants in a large nest is to make several holes with a bar or broom handle to the depth of a few inches in different parts of their habitation. Pour into each hole about a tablespoonful of carbon bi-sulphide, and then cover the whole nest with a blanket. The heavy fumes of the insecticide will permeate the ant hill, killing all insect life. The operation may be made more effective by exploding the vapour under the blanket by the aid of a light on the end of a pole. This drives the poisonous fumes throughout the nest, rendering them more fatal to the inmates. The best time for this treatment is towards the evening, when most of the ants will be at home.

SOLDIER AND JUMPER ANTS

can be effectually destroyed by this process.

Another good remedy is to pour half a pint of gasoline into the hill or nest, and set it afire. The gasoline will instantly spread through all the galleries of the nest, and, as the heat on the surface increases, the gas will generate in the utmost recesses and the fire will cook the ants. Half a pint of gasoline will burn from three to eight hours, and every ant in the nest, or attempting to enter, will be destroyed.

TO CLEANSE A CUPBOARD

infested with red or black ants, all the shelves should be washed with carbolic acid and water, or carbolic soap. If the scent of the carbolic is offensive, as it is to some persons, use the following:—A large lump of ammonia dissolved in hot water, and more cold water added. The proportion is—ammonia the size of a hen's egg to a quart of water. Brush the shelves well over with it. The ants will quickly leave, as they dislike the scent of ammonia.

TO KEEP ANTS AWAY FROM TREES.

Take White Lime (slaked)	..	..	..	6 quarts.
Kerosene oil	..	..	..	1/2 pint.
Turpentine	..	..	..	1 wineglass.
Soft soap	..	..	..	5 lb.
Cow manure	..	..	..	3 quarts.
Water	..	..	..	16 quarts.

Mix the whole thoroughly together, and apply freely with a paint brush to the trunks of trees or shrubs.

It is said that trees can be protected against ants by saturating woollen strings with castor oil, and tying them tightly round the trunk. The ants go up as far as the strings, but none will cross them. Cotton strings will not do. Woollen yarn must be used.

TO GET RID OF BLACK ANTS.

Mix 10 parts of sugar with 100 parts of water, and boil. Cool, and then add 1 part of tartar emetic, and stir. Set this about in tins covered with muslin or wire netting. A very similar method is to use in exactly the same way a mixture of 1 oz. of jam or syrup and 10 grains of finely powdered corrosive sublimate.

Another remedy, involving no poison, is to soak a piece of sponge in sweetened water. When it is full of ants, drop it into boiling water, and sweeten afresh for a second lot of ants. Ants are curiously intelligent when once they have grasped the idea; so they keep away.

A third remedy: Mix flour, sugar, and arsenic to the consistency of putty with water, and place pieces of the mixture about the nests of the ants. If an examination is made in a few days after using this remedy, hundreds of dead ants will be found in the vicinity of the poison; and it is very unlikely that the ants will reappear on a spot where the mixture has been used.

TO PREVENT ANTS CLIMBING FRUIT TREES.

If chalk is rubbed on the bark of a tree, it will absolutely prevent ants from climbing. If they are above it, they fall the instant they set foot on the chalk when descending. They appear to lose their foothold. The correspondent who supplies this information mentions his experiment with a nectarine tree which was covered with black aphids. Observing that there was a continuous stream of black ants ascending and descending, he smoothed the bark of the stem to a width of about 6 or 7 in., and rubbed this space with chalk. The chalk was renewed from time to time as it fell or was washed off. That year there was not an aphid or black leaf on the tree, nor had there been any since. The ants, cut off from their food supply, were exterminated. "A chalk ring," he says, "drawn round a sugar ants' nest is equally effective." This is worth a trial, as, if successful, chalking the legs of tables and meat safes would preserve the contents from the ants.

Another way of preventing ants from climbing is said to be cheap and effective. Tie a rabbit skin (upside down, tail up the tree), fur

outwards, tightly round the stem. The ants start to climb up the fur, and as they reach the end of each single hair, the hair drops and lets them down. The ants always give it us as a bad job.

REMEDIES FOR WHITE ANTS ATTACKING LIVING TREES.

There are two ways in which the pests may be got rid of—one by arsenical poisoning; the other by the use of bisulphide of carbon, as already described. For the first plan, get 3d. worth of arsenic, and pound it as fine as flour. Next, collect as many ants as possible, mix the ants with the arsenic, some molasses, and a little soil. Make this into a ball, and place it near the ants' nest. The living ants will devour the dead ones, and their followers will devour them. Thus there will be an end of them.

A good remedy is apterite, which is destructive to most insect life when chipped into the ground, and is not harmful to plants.

Sugar and arsenic spread between slips of pine wood, and covered with an inch of soil, is a good trap for white ants.

GREEN HEAD ANTS.

These are most difficult to deal with, as they make their nests in inaccessible places and run long galleries out to some distance. Unless the nests can be located and bisulphide poured into them, there is little hope of getting rid of them.

ANT EXTERMINATION GENERALLY.

For the extirpation of ants the following remedies are good. To be effective, they require attention and perseverance. It is well to find their main burrow or nest, if possible. Arsenic is sure destruction to them, but it is dangerous to handle:—

Air-slaked lime plentifully dusted in warm dry weather over and around the hills, or in the house or other places infested, will cause the ants to vacate them in a short time.

Snuff: Dust a little snuff upon the floor of the rooms or pantry.

Draw a thick chalk line around a smooth tree or across an upright board or post, and they will not pass over it.

Camphor: Put a piece of camphor, the size of a filbert nut, into 2 quarts of hot water. When cold, apply to pot and other plants, and the insects will be driven off without injury to the plants.

Mix together 1 part of calomel and 10 parts of finely powdered white sugar, and lay it in little heaps about their nests and runs. The ants will eat it and die.

Coal oil, mixed with six times its bulk of water, sprinkled over the nests every few days, will kill and drive them away.

Pans or saucers, nearly filled with honey or sweet oil, attract ants, and they are drowned in it.

Flowers of sulphur, $\frac{1}{2}$ lb.; potash, 4 oz. Set in an earthen vessel over the fire until dissolved and united. Afterwards beat to a powder.

Infuse a little of the powder in water and sprinkle in places infested with ants.

To Destroy Black Ants: A few leaves of green wormwood scattered among the haunts of black ants will drive them away.

Red Ants: Powdered borax sprinkled around will exterminate both red and black ants.

Make holes in the ant hills, 6 in. deep and 1 ft. apart, with an iron or zinc tube fitted with a wooden stake. Withdraw the stake. Pour 1 tablespoonful of bisulphide of carbon down the tube. Withdraw the tube and stop the hole immediately. Bisulphide of carbon is very inflammable.

RECORD PRICE FOR A PIG.

A correspondent writes from Tinana, Maryborough, that, at the monthly sales held on the 7th September, high prices ruled throughout for pigs, the reason being probably, the very great demand by the bacon factories. Very brisk bidding took place for a fine "backfatter," sold on behalf of Mr. Chas. Fortey, of Newtown. The bids ran up to £7 17s. 6d., which is easily a record for a pig in Queensland sold for commercial purposes. It would be interesting to know how this pig panned out in the way of bacon, hams, and sundries in the factory.

A SYMPTOM OF WORMS IN SHEEP.

A correspondent at Cloncurry, who last year lost 20 per cent. of his lambs, noticed that, at about from three to six months old, they developed a lump under the throat, and wrote to the Department for advice on the matter. Mr. W. G. Brown, Instructor in Sheep and Wool, advised as follows:—

One of the most decisive symptoms of worms in sheep is the lump under the jaw. The fact that lambs from four to six months old die from this complaint is a very strong corroboration of intestinal or stomach worms. If these lambs be drenched with a suitable drench, they should not die. If the fourth stomach were opened, twisted wire-worms in thousands would be found. Mr. Brown sent directions for making the drench, which, he said, would be found so effective that it was a certainty that no drenched lambs would die of stomach worms.

TIMES OF SUNRISE AND SUNSET AT BRISBANE—1915.

(From which those at places west of Brisbane can be reckoned.)

COMPUTED BY D. EGLINTON, F.R.A.S.

Date.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		PHASES OF THE MOON, 1915.
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	6.4	5.33	5.30	5.47	4.59	6.4	4.46	6.27	<p>On or about the 150th Meridian, East Long.</p> <p>H. M.</p> <p>2 Sept. ☾ Last Quarter 12 56 a.m.</p> <p>9 " ● New Moon 8 52 p.m.</p> <p>16 " ☾ First Quarter 5 21 "</p> <p>23 " ○ Full Moon 7 35 "</p> <p>The moon will be at its least distance from the earth, roughly about 226,000 miles, on 14th September; and at its greatest distance, about 252,000 miles, on 2nd and 30th September.</p>
2	6.3	5.33	5.29	5.48	4.58	6.4	4.46	6.28	
3	6.2	5.34	5.28	5.48	4.58	6.5	4.46	6.28	
4	6.1	5.34	5.27	5.49	4.57	6.6	4.46	6.29	
5	6.0	5.35	5.26	5.49	4.57	6.6	4.46	6.29	<p>1 Oct. ☾ Last Quarter 7 44 p.m.</p> <p>9 " ● New Moon 7 42 a.m.</p> <p>15 " ☾ First Quarter 11 51 p.m.</p> <p>23 " ○ Full Moon 10 15 a.m.</p> <p>31 " ☾ Last Quarter 2 39 p.m.</p> <p>The moon will be at its least distance from the earth on 11th October, and at its greatest distance on the 27th.</p>
6	5.59	5.35	5.25	5.50	4.56	6.7	4.46	6.30	
7	5.58	5.36	5.24	5.50	4.55	6.8	4.46	6.30	
8	5.57	5.36	5.23	5.51	4.54	6.9	4.47	6.31	
9	5.56	5.37	5.22	5.51	4.53	6.10	4.47	6.32	<p>7 Nov. ● New Moon 5 52 p.m.</p> <p>14 " ☾ First Quarter 9 3 a.m.</p> <p>22 " ○ Full Moon 3 36 "</p> <p>30 " ☾ Last Quarter 8 10 "</p> <p>The moon will be at its least distance from the earth at midnight on 8th November, and at its greatest distance on the morning of the 24th.</p>
10	5.55	5.37	5.21	5.52	4.53	6.11	4.47	6.33	
11	5.53	5.38	5.20	5.52	4.52	6.11	4.47	6.34	
12	5.52	5.38	5.19	5.53	4.51	6.12	4.47	6.35	
13	5.50	5.38	5.18	5.53	4.51	6.12	4.48	6.36	<p>7 Dec. ● New Moon 4 3 a.m.</p> <p>13 " ☾ First Quarter 9 38 p.m.</p> <p>25 " ○ Full Moon 10 52 "</p> <p>29 " ☾ Last Quarter 10 59 "</p> <p>The moon will be at its least distance from the earth on the morning of 7th December, and at its greatest distance on the morning of the 21st.</p>
14	5.49	5.39	5.17	5.54	4.50	6.13	4.48	6.36	
15	5.48	5.39	5.16	5.54	4.50	6.14	4.48	6.37	
16	5.46	5.40	5.15	5.55	4.49	6.15	4.49	6.38	
17	5.45	5.40	5.14	5.55	4.49	6.16	4.49	6.38	
18	5.44	5.41	5.13	5.56	4.48	6.16	4.50	6.39	
19	5.43	5.41	5.12	5.56	4.48	6.17	4.50	6.39	
20	5.42	5.42	5.11	5.57	4.48	6.18	4.51	6.40	
21	5.41	5.42	5.10	5.57	4.48	6.19	4.51	6.40	
22	5.40	5.43	5.9	5.58	4.47	6.20	4.52	6.41	
23	5.39	5.43	5.8	5.58	4.47	6.21	4.52	6.41	
24	5.37	5.44	5.7	5.59	4.47	6.21	4.53	6.41	
25	5.36	5.44	5.6	5.59	4.47	6.22	4.53	6.42	
26	5.35	5.45	5.5	6.0	4.47	6.23	4.54	6.42	
27	5.33	5.45	5.4	6.0	4.47	6.24	4.54	6.42	
28	5.32	5.46	5.3	6.1	4.47	6.25	4.55	6.43	
29	5.31	5.46	5.2	6.1	4.47	6.26	4.55	6.43	
30	5.30	5.47	5.1	6.2	4.47	6.27	4.56	6.44	
31	...	...	5.0	6.3	...	...	4.56	6.44

For places west of Brisbane, but nearly on the same parallel of latitude—27½ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun would rise and set about 4 minutes later than at Brisbane if its elevation (1,900 feet) did not counteract the difference in longitude. In this case the times of sunrise and sunset are nearly the same as those for Brisbane.

At St. George, Cunnamulla, Thargomindah, and Oontoo the times of sunrise and sunset will be about 17 m., 28 m., 36 m., and 47 minutes, respectively, later than at Brisbane at this time of the year.

At Roma, on 1st September, the sun will rise about 6.19 and set about 5.51; on 1st October it will rise about 5.46 and set at about 6.4; on 1st November it will rise about 5.18 and set at about 6.20; on 1st December it will rise about 5.7 and set at about 6.41.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed by D. Eglinton, F.R.A.S., and should not be reproduced without acknowledgment.]

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR SEPTEMBER, 1915.

[illegible]

VEGETABLES.

Cabbages, per dozen	...	...	...	...	...	6d. to 2s.
Cauliflowers, per dozen	...	...	...	...	...	1s. to 5s. 6d.
Beans, per sugar bag	...	...	...	...	...	3s. to 4s.
Beetroot, per dozen bunches	...	...	...	...	...	6d. to 9d.
Carrots, per dozen bunches	...	...	...	...	...	9d. to 1s. 3d.
Chocos, per quarter-case	...	...	...	...	...	1s. 9d. to 2s. 6d.
Cucumbers, per dozen	...	...	...	...	...	...
Custard Marrows, per dozen	...	...	...	...	...	2s. 6d. to 4s.
Vegetable Marrows, per dozen	...	...	...	...	...	2s. 6d. to 4s.
Lettuce, per dozen	...	...	...	...	...	...
Peas, per sugar bag	...	...	...	...	...	1s. to 2s. 6d.
Parsnips, per dozen bunches	...	...	...	...	...	1s. to 1s. 3d.
Celery, per dozen bunches	...	...	...	...	...	10d. to 1s. 6d.
Sweet Potatoes, per cwt.	...	...	...	...	...	6s. 9d. to 7s. 6d.
Table Pumpkins, per cwt.	...	...	...	...	...	7s. 6d. to 8s.
Tomatoes, per quarter-case	...	...	...	...	...	2s. to 7s.
Turnips, per dozen bunches	...	...	...	...	...	6d. to 9d.
Rhubarb, per bundle	...	...	...	...	...	1s. to 1s. 6d.

SOUTHERN FRUIT MARKETS.

Article.	SEPTEMBER.					
	Prices.					
Bananas (Queensland), per case	10s. to 12s.
Bananas (Fiji), per case	17s. to 18s. 6d.
Bananas (G.M.), per case	20s. to 23s.
Mandarins, per case	5s. to 7s.
Oranges (Navel), per case	6s. to 8s.
Oranges (other), per case	5s. to 7s.
Passion Fruit (Local), per half-case	2s. to 10s.
Lemons, per bushel case	3s. to 5s. 6d.
Papaw Apples, per half-case
Pineapples (Queens), per case	5s. to 7s. 6d.
Pineapples (Ripleys), per case	4s. to 6s.
Pineapples (Common), per case	4s. to 6s.
Strawberries (Queensland) per tray	3s. to 5s.
Tomatoes, per quarter-case	5s. to 9s.
Cucumbers, per case	6s. to 8s.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	SEPTEMBER.					
	Prices.					
Apples (Tasmanian), per case	7s. to 10s.
Apples (Croftons), per case	14s.
Apples, Cooking, per case	6s. to 10s.
Bananas (Cavendish), per dozen	2d. to 5d.
Bananas (Sugar), per dozen	1 ³ / ₄ d. to 3d.
Cape Gooseberries, per quarter-case	5s. to 7s. 6d.
Cocanuts, per sack	12s. to 15s.
Custard Apples, per quarter-case	5s. to 8s.
Granadillas, per quarter-case
Lemons (Lisbon), per case	5s. to 7s. 6d.
Limes (Choice), per quarter-case	2s. to 3s. 6d.
Mandarins, per half-case	6s. to 8s.
Oranges(Navel), per case	6s. to 8s.
Oranges (other), per case	3s. 6d. to 5s.
Papaw Apples, per quarter case	1s. to 2s. 6d.
Papaw Apples (Prime), per quarter-case	3s.
Passion Fruit, per case	6s. 6d. to 7s. 6d.
Peanuts, per pound	3d. to 4d.
Rosellas, per sugar bag
Pineapples (Ripley), per dozen	1s. 9d. to 3s. 6d.
Pineapples (Rough), per dozen	9d. to 1s. 6d.
Pineapples (Smooth), per dozen	1s. 9d. to 3s. 6d.
Strawberries, per dozen pint boxes	3s. 6d. to 7s.
Strawberries, per tray
Tomatoes, per quarter-case	2s. to 5s. 6d.

TOP PRICES, ENOGGERA YARDS, AUGUST, 1915.

Animal.	AUGUST.	
	Prices.	
Bullocks	£31 to £41 5s.	
Cows	£14 to £16 17s. 6d.	
Merino Wethers	54s. 9d.	
Crossbred Wethers	63s.	
Merino Ewes	46s. 9d.	
Crossbred Ewes	50s.	
Lambs	44s. 6d.	
Pigs (Porkers)	44s. 6d.	

EXHIBITION PRICES.

Animal.	AUGUST.	
	Prices.	
Bullock (Champion)	£46	
Bullock (Guessing)	£37	
Bullock	£39	
Cows (Champion)	£20 5s.	
Cows	£22 5s.	
Crossbred Wethers	81s.	
Merino Wethers	55s. 6d.	
Crossbred Ewes	54s.	
Lambs (Crossbreds)	51s.	

LONDON QUOTATIONS.

London, 11th September.—Danish butter is quoted at 174s. to 176s. per cwt.

The Liverpool quotation for middling American cotton, September-October shipment, is 5.94½d. per lb.

Jute, September-October shipment from Calcutta, £26 per ton.

Hemp is dull. October-December shipment, £33 per ton.

Mexican Sisal: It is stated in Messrs. Landauer and Co.'s report for 11th August (London) that, owing to a sharp fall in exchange and freight, prices have moved in favour of buyers. Offers have been received for forward shipment at £34 per ton for fair average quality. No business had apparently been concluded, but a small parcel of good quality in store was offering at £36 per ton. From statistics to hand it was to be noted that the shipments of sisal hemp from the Port of Progreso (Mexico) during the month of June reached the record figure of 132,356 bales against 89,208 bales during June, 1914.

Stocks on hand in Progreso, 30th June, 1915 81,912 bales.

Stocks on hand in Progreso, 30th June, 1914 28,567 bales.

Shipments of sisal this year presumably only reach the United States. The market was quiet for Mauritius hemp, spot values remaining at £33 to £33 10s. for prime, £31 to £31 10s. for good fair, and £30 to £30 10s. for ordinary grades.

Rubber, fine hard Para, 2s. 4½d. per lb.; plantation, first latex crepe, 2s. 4d.; smoked sheet, 2s. 4d.

Copra, South Sea, September-October shipment, £22 15s. per ton.

Orchard Notes for November.

THE SOUTHERN COAST DISTRICTS.

November is somewhat of an off month for fruit, as the crop of strawberries is about over; pineapples, with the exception of a few off season fruit, are not ready for marketing; and citrus fruits of all sorts, with the exception of those grown in the latest districts, are now over. Bananas should, however, be improving, particularly if the season is favourable.

The most important work of the month is the cultivation of the orchard, as, in order to retain moisture in the soil, it is essential that the soil be kept in a fine state of tilth. Where land is liable to wash, breaks should be left between the fine-worked land, or, even better, a good break of cowpea or other leguminous crop, valuable for producing nitrogen and humus, should be grown. All fruit pests should be attended to; cyaniding can be carried out where necessary, and is especially useful now in the case of the Red, Purple Mussel, Circular Black, and Glover Scales. Fruit-fly should be systematically fought; all infested plums, peaches, guavas, or other fruits should be gathered and destroyed, so as to prevent the spread of the pest. Sucking bugs of all sorts should be gathered and destroyed, the egg-clusters, as well as the immature and mature insects, being destroyed. Hand-gathering is as good a plan as any. Fig beetles should be destroyed by spraying with Kedzie's mixture; and the egg-clusters should be destroyed whenever found.

Bananas and pineapples can be planted during the month, taking care, in the case of the pineapples, not to set out suckers that will immediately throw out a fruit, but those that will become firmly established before they fruit. Examine the vineyard carefully, and keep it well worked. Look out for Oïdium and Black Spot, and treat for same as recommended in the Orchard Notes of the two previous months.

Early ripening grapes will be reaching maturity towards the end of the month; but few, if any, will be ripe. In any case do not market too immature fruit; rather wait a few days longer, till it is fit to eat.

THE TROPICAL COAST DISTRICTS.

The main crop of pineapples will ripen during the month; and if gathered at the right time—viz., when fully developed, but not turned colour—they will carry all right South, if carefully handled and well packed. Papaws and granadillas are still in season, and will meet with a good Southern demand; they must be packed in cases containing only a single layer of fruit, and should be sent in the cool chamber. I am certain that a good market can be got for these fruits in both Melbourne and Sydney, particularly at this time of the year, when their winter fruits are off and their summer fruits are not yet on.

Watch bananas carefully for fly. Keep the orchards well cultivated.

Only ship good mangoes South; far too much rubbish is sent to Brisbane. Good mangoes will pay to pack properly, but the common sorts, which predominate to an enormous extent, will barely pay freight, if there is a good crop. The canning of good types of fibreless mangoes of good flavour is well worth taking up commercially in the North, as a ready sale for the canned fruits can be obtained.

As in the Southern Coast districts, all fruit pests should be systematically fought, and the orchard should be kept in a good state of tilth, as, once the wet season starts, there is little chance of cleaning up weeds and rubbish of all kinds, or of cultivating and sweetening the soil.

THE SOUTHERN AND CENTRAL TABLELANDS.

The earlier kinds of summer fruits, such as cherries, will ripen during the month. See that, if fruit-fly makes its appearance, it is systematically fought.

Look out for Codling Moth, and continue the sprayings with Kedzie's mixture.

Look out carefully for any San José scale that may have escaped the winter spraying, as, if the trees are sprayed whilst the young are hatching out, the bulk of the insects are killed and little damage is done either to tree or fruit.

The sulphide of soda spray is one of the best to use now. Keep Woolly Aphis in check, should it make its appearance, using the resin washes; or, if it and San José scale are both present, use the sulphide of soda spray.

Watch the vineyards carefully for Black Spot and Oïdium. Keep the orchard and vineyard well cultivated, so as to retain all the moisture in the soil required for the growth of the tree and development of the fruit. In the warmer parts, irrigate when necessary, following the irrigation by deep and systematic cultivation.

See that grape vines have plenty of foliage to protect the ripening fruit from sun scald, but yet not so dense a foliage as to induce Oïdium or Black Spot. Look out for Red Scale on citrus trees, and cyanide to check same. Look out for fruit-fly in the early ripening fruits, and gather and destroy all that may be so affected.

Farm and Garden Notes for November.

FIELD.—Under ordinarily favourable conditions, harvesting the wheat and barley crops may now begin. Those who have oats for hay should cut it when the grain has formed, but before it is ripe, for then the plant is in its most nourishing condition. Destroy caterpillars on tobacco plants, and top the latter so as to throw all the strength into the leaves. Keep down the weeds, which will now try to make headway;

earth up any growing crops requiring the operation; sow maize, imphee, setaria, kafir corn, teosinte, sorghum, &c. Plant sweet potatoes, sisal hemp, yams, peanuts, and ginger.

KITCHEN GARDEN.—Why do so few gardeners and farmers grow their own vegetables? This is a question frequently asked by visitors to the farming districts. The reason probably is, that vegetables require a good deal of care and attention, which means also a good deal of time taken from the ordinary farm work. In many cases it pays the farmer better to buy many kinds of vegetables than to grow them himself. The only vegetables grown on many fine farms are cabbages and pumpkins, not to class potatoes under the head. Many people have an idea that European vegetables cannot be grown during the hot summer months, but this is a great fallacy; the Chinese gardeners supply the town with all kinds of vegetables, except, perhaps, cauliflowers, during the whole of the summer. It is, therefore, clear that, by constant work, plenty of manure, water, and some shade for seedlings, most vegetables can be produced during the hot months from November to March. If your ground has been trenched or deeply dug and well worked, the advantages will be seen during the coming months. It does not pay to work shallow-dug ground. When sowing and planting during this month, give plenty of room between the rows and the plants, otherwise they will be drawn up and worthless, and keep the ground open by constant forking and hoeing. Thin out melon and cucumber plants. It is a good plan to peg down the vines; they will then not be blown about by the wind; they will take root at intervals, and thus help the main stalk. Give plenty of water to tomatoes planted out last month. They should also be mulched. Sow cabbage, French beans, melons, lettuce, radishes, pumpkins, cucumbers, marrows, rosellas, &c.; and transplant for succession in calm cloudy weather.

FLOWER GARDEN.—Stake any dahlias which may be now above ground, and plant out the bulbs which were stored in a moist place. If the weaker bulbs are reserved, they will come in for autumn planting. Take up all bulbs which have done flowering, and store them in a dry place. Winter-flowering plants will have gone off almost; still, the garden should be in full bloom, and will well repay the trouble bestowed on it, and a little fertiliser given as a top-dressing will assist the plants to bloom and look well for a longer time than if they were neglected. Give weak liquid manure to chrysanthemums, and allow no suckers to grow till the plants have done flowering. Take up narcissi. Do not store them, but plant them at once in new situations. Sow anthirrhinum, balsam, zinnia, summer chrysanthemum, calliopsis, and nemophila.

LIST OF AGRICULTURAL, HORTICULTURAL, AND PASTORAL SOCIETIES AND ASSOCIATIONS IN QUEENSLAND.

Societies and associations desirous of being registered and placed on the above list must make application to that effect, and forward to the Under Secretary for Agriculture and Stock the following particulars:—

Number of members who have paid their subscriptions for 1912.

Number of meetings held by the Society during 1912.

Date of the last meeting.

Name of the Secretary for 1913.

It is equally necessary that prompt notice be given to the Editor of changes in the Secretaryship of any Society or Association, a matter which is much neglected. Furthermore, information concerning dates on which shows are to be held must be forwarded to the Editor at least six weeks before the Show date. If these suggestions are not complied with, the Society whose Secretary neglects to supply the required information will be liable to be struck off the list of Societies published monthly in the Journal.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1914	1915.
Allora ...	Central Downs Agricultural and Horticultural Association	J. C. Marshall ...	17 and 18 Feb.	17 and 18 Feb.
Aloomba, <i>via</i> Cairns	Aloomba Farmers' Association ...	Hugh A. Niven ...		
Amberley ...	Amberley Farmers' Progress Association	J. T. Goldsborough		
Atherton ...	Atherton Agricultural, Pastoral, and Industrial Association	H. McKnight ...		
Atherton ...	Atherton Table Land Agricultural Society	H. McKnight ...	...	22 and 23 Sept.
Ayr ...	Lower Burdekin Farmers' Association	R. W. Edwards ...		
Ayr ...	Lower Burdekin Pastoral, Agricultural, and Industrial Association	C. G. M. Boyce ...	11 and 12 June	
Bajool ...	Bajool and Ulam Farmers' Progress Association	A. T. Mitchell ...		
Ban Ban, <i>via</i> Byrnestown	Dundar Branch of the Queensland Farmers' Union	Geo. Gwynne ...		
Banyan, <i>via</i> Cardwell	Banyan and Tully River Agricultural Association	A. J. Harman ...		
Barcaldine ...	Barcaldine Pastoral Agricultural and Horticultural Association	W. J. P. Chambers		
Beaudesert ...	Logan and Albert Agricultural and Pastoral Society	M. Selwyn Smith	12 and 13 May	11 and 12 May
Beenleigh ...	Agricultural and Pastoral Society of Southern Queensland	Capt. C. G. Gehrman	3 and 4 Sept.	23 and 24 Sept.
Beenleigh ...	Logan Farmers' and Industrial Association	Wm. G. Winnett ...		
Beerwah ...	Coochin Creek District Agricultural and Progress Association	E. F. Jones ...		
Belli ...	Belli Creek Farmers' Progress Association	W. E. Neumann ...		
Berwen ...	Haughton River Farmers' Association	James Griffith ...		
Biggenden ...	Biggenden Agricultural and Pastoral Society	C. J. Stephensen ...	9 and 10 July	22 and 23 June
Bin Bin, <i>via</i> Gooroolba	Bin Bin Farmers and Settlers' Association	Milo Burke ...		
Blackall ...	Barcoo Pastoral Society ...	C. M. Pegler ...		
Blenheim ...	Blenheim and District and Farmers' Progress Association	W. A. Zerner ...		
Blythedale ...	Blythedale Agricultural Progress Association	J. L. Quinn ...		
Boonah ...	Fassifern and Dugandan Agricultural and Pastoral Association	J. McKenzie ...	20 and 21 May	19, 20, and 21 May
Boowoogum...	Brooyar Farmers' Progress Association	Jas. Cahill ...		
Bowen ...	Bowen Farmers' Association ...	H. Reye ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1914.	1915.
Bowen ...	Bowen Pastoral, Agricultural and Mining Association	F. Sellars ...	22, 23, and 24 July	
Brisbane ...	The Queensland Dairy Herd Book Society	Alfred Gorrie ...		
Brisbane ...	National Agricultural and Industrial Association of Queensland	J. Bain ...	10 to 15 Aug.	9 to 14 Aug.
Brisbane ...	Queensland Chamber of Agricultural Societies	J. Bain ...		
Brisbane ...	Horticultural Society of Queensland	F. W. Woodroffe ...		
Bucca, <i>via</i> Bundaberg	United Farmers' Association ...	J. H. Hendy ...		
Buderim	Buderim Branch of the Queensland Farmers' Union	Capt. G. Burrows ..		
Bundaberg ...	Bundaberg Agricultural, Pastoral, and Industrial Society	Redmond Bros. ...	3 and 4 Sept.	9 and 10 Sept.
Bundaberg ...	Canegrowers' Union of Australia (Woongarra Branch)	O. H. Klotz ...		
Bundaberg ...	Woongarra Canegrowers' Association (A.S.P.A. Branch)	G. O. Strathdee ...		
Bunerba, Deeford (<i>via</i> Westwood)	Bunerba Farmers' Progress Association	G. F. Barnes ...		
*Burrum ...	Burrum District Farmers' and Fruit-growers' Association	S. E. Tooth ...		
Byrnestown...	Byrnestown Farmers and Dairy-men's Progress Association	Patrick Gilmore ...		
Caboolture ...	Caboolture Pastoral, Agricultural, and Industrial Society	C. V. Hemming ...	1 May	29 and 30 April
Cairns ...	Cairns Agricultural, Pastoral, and Mining Association	H. McMahon ...		
Cairns ...	Cairns Horticultural Society ..	R. Tweedie ...		
Cedar Pocket, Gympie	Cedar Pocket Farmers' Association...	W. A. Fraser ...		
Charleville ...	Central Warrego Pastoral and Agricultural Association	T. C. Fallis ...	4 and 5 May	
Charters Towers	Charters Towers Pastoral, Agricultural, and Mining Association	A. H. Pritchard ...	1 and 2 July	6 to 8 July
Charters Towers	The Towers Horticultural Society ...	Jas. H. Chappel ...	19 and 20 August	25 and 26 August
Chatsworth ...	Chatsworth Combined Farmers' Association	F. W. Johns ...		
Chatsworth ...	Chatsworth Farmers' Progress Association	W. Allen ...		
Childers ...	Childers Pastoral, Agricultural, and Industrial Society	J. R. Wrench ...	18 and 19 June	10 and 11 June
Childers ...	Doolbi Canegrowers' Association ...	R. S. Rankin ...		
Chinchilla ...	Canaga Farmers' Progress Association	G. H. Rochester ...		
Chinchilla ...	Pelican Farmers and Settlers' Association	H. K. Nevell ...		
Chinchilla ...	Chinchilla Agricultural and Pastoral Association	B. Mackie ...	14 and 15 April	6 and 7 April
Clermont ...	Peak Downs Pastoral, Agricultural, and Horticultural Society	A. S. Narracott ...	23 and 24 June	
Clifton ...	Darling Downs Pastoral, Agricultural, and Industrial Association	S. C. Mott ...	30 Sept. and 1 Oct.	22 and 23 Sept.
Coochin ...	Coochin Farmers' Progress Association	W. Watson ...		
Cooktown ...	Cooktown District Pastoral, Agricultural, Mining, and Industrial Association	E. A. S. Olive ...	1 and 2 July	
Cooroy ...	Cooroy West Farmers' Progress Association	O. M. Proll ...		
Cooroy ...	Mount Cooroy Progress and Farmers' Association	L. H. Baldwin ...		
Coulson ...	Coulson Farmers' Progress Association	Gustav A. Lewald		
Coulstoun, <i>via</i> Biggenden	Coulston Lakes Branch of the Queensland Farmers' Union	P. E. Britnell ...		
Crow's Nest	Crow's Nest Agricultural, Horticultural, and Industrial Society	James Gleeson ...	28 and 29 April	6 and 7 April
Dalby ...	Northern Downs Pastoral and Agricultural Association	W. R. Hunter ...	26 and 27 May	21 and 22 April

* Monthly meetings held alternately at Burrum and Howard.

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1914.	1915.
Dallarnil ...	Dallarnil Farmers and Dairymen's Association	H. J. Piper ...		
Didcot ...	Didcot Farmers and Settlers' Association	Fred. Jones ...		
Deeford, (Dawson Valley)	Dundee Farmers and Settlers' Progress Association	C. G. Young ...		
Degilbo ...	Emu Creek Farmers and Dairymen's Progress Association	J. E. Peterson ...		
Dirran, <i>via</i> Malanda	Dirran Settlers' Progress Association	Percy G. R. Dutton		
Emerald ...	Emerald Pastoral and Agricultural Society	J. Esmond ...	...	26 and 27 May
Esk ...	Esk and Toogoolawah Pastoral, Agricultural, and Industrial Association	Thos. C. Pryde ...	5 and 6 May (at Toogoolawah)	8 and 9 June
Eukey, <i>via</i> Ballandean	Eukey Farmers and Fruit-growers' Association	H. H. Stanton ...		
Evelyn ...	Millstream Farmers and Settlers' Association	H. R. Gardiner ...		
Fairford ...	Fairford Agricultural and Pastoral Association	H. E. Hollins ...		
Fordsdale, <i>via</i> Grantham	Fordsdale Farmers' Association ...	W. M. Ridley ...		
Forest Hill ...	Forest Hill Agricultural and Progress Association	J. Stoddart ...		
Gayndah ...	Pastoral, Industrial, Agricultural, and Horticultural Association	M. C. Stephensen...	9 and 10 June	22 and 23 June
Gayndah ...	Gleneden Branch of the Queensland Farmers' Union	W. S. Morris ...		
Gayndah ...	Gurgeena Farmers' Progress Association	W. G. Leaver ...		
Gayndah ...	Binjour Farmers' Progressive Association	F. G. Hunter ...		
Gin Gin ...	Currajong and Gin Gin Agricultural, Pastoral, and Industrial Society	C. M. Morris ...	27 and 28 May	17 and 18 June
Gladstone ...	Port Curtis Agricultural, Pastoral, and Mining Association	J. T. W. Brown ...	...	18 and 19 May
Glen Aplin ...	Ballandean Fruitgrowers' Association	W. H. C. Laird ...		
Gooburru ...	Gooburru Farmers' and Cane-growers' Association	W. J. Lutin ...		
Goomboorian road <i>via</i> Gympie)	Ross and Mullin's Creek Farmers' Progress Association	R. E. Kitchen ...		
Goombungee	Goombungee Agricultural, Horticultural and Pastoral Society	J. J. Morgan ...	...	24 March
Goondiwindi	Comoron-Moorobie Farmers' Progress Association	J. Johnston ...		
Goondiwindi	MacIntyre Pastoral and Agricultural Society	E. T. Drake ...	29 and 30 April	
Gooroolba ..	Gooroolba Farmers and Settlers' Progress Association	H. A. Harrison ...		
Grantham ...	Ma Ma Creek Farmers' Progress Association	A. McKenzie ...		
Gympie ...	Agricultural, Mining, and Pastoral Society	F. W. Shepherd ...	9 and 10 Sept.	1 and 2 Sept.
Gympie (Goomboorian road)	The Veteran and Scrubby Creek Farmers' Progress Association	T. T. Ramskill ...		
Hambledon (Cairns)	Hambledon Cane Farmers' Association	F. C. P. Curlewis		
Hawthorn (Daymar Siding)	Weengallon Farmers and Settlers' Progress Association	Laurence A. Seeger		
Helidon ...	Flagstone Creek Branch of the Queensland Farmers' Union	Fred Tuffrey ...		
Herberton ...	Herberton Mining, Pastoral, and Agricultural Association	Richard Barton ...	13 and 14 April	5 and 6 April
Hughenden...	North Western Queensland Pastoral and Agricultural Association	H. P. Blackall ...	11 and 12 May	

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1914.	1915.
Ingham ...	Herbert River Pastoral and Agricultural Association	R. L. Jones ...	4 and 5 Sept.	17 and 18 Sept.
Inglewood ...	Inglewood Agricultural, Pastoral, and Horticultural Society	J. F. Cheshire ...	19 and 20 Marc	24 and 25 March
Inkerman (Lower Burdekin)	Inkerman Farmers and Graziers' Association	L. M. Osborne ...		
Innisfail ...	Johnstone River Canegrowers and Manufacturers' Association	Ralph Reid ...		
Innisfail ...	Johnstone River Agricultural Society	T. Nesbet ...		
Ipswich ...	The Queensland Pastoral and Agricultural Society	G. W. Allen ...	27 and 28 May	26 and 27 May
Ipswich ...	Ipswich Horticultural Society	Hugh Parkinson ...		
Jackson (Western Line)	Parish Woleebee Settlers' Association	S. C. Griffin ...		
Jardine ...	Jardine Farmers' and Fruitgrowers' Association	H. M. Scheibe ...		
Juandah ...	Juandah Dairy and Progress Association	R. Bowie ...		
Kamma (Cairns)	The Cairns Canegrowers' Association	C. V. Hives ...		
Kenmore ...	Brookfield, Pullen Vale, and Moggill Farmers' Association	F. B. Howard ...		
Kilcoy ...	Kilcoy Pastoral, Agricultural, and Industrial Society	W. E. Reason ...	14 and 15 May	6 and 7 May
kivan ...	Kilkivan Pastoral, Agricultural, and Industrial Association	F. E. Hopkins ...	2 July	9 and 10 June
Killarney ...	Killarney Agricultural Society	L. W. Wilkinson ...	...	24 and 25 Feb.
Kingaroy ...	Agricultural, Pastoral, and Industrial Society	R. A. Pearce ...	20 and 21 May	24 and 25 March
Kin Kin, <i>via</i> Cooran	Kin Kin and District Farmers' Progressive Association	A. C. Stewart ...		
Kooroongarra, <i>via</i> Inglewood	Kooroongarra Farmers' Progress Association	J. French ...		
Laidley ...	Farmers' Progress Association	G. A. Moulday ...		
Laidley ...	Lockyer Agricultural and Industrial Society	F. Roberts ...	...	21 and 22 July
Lake Clarendon (<i>via</i> Gatton)	Lake Clarendon Branch of the Queensland Farmers' Union	W. J. Walton ...		
Lockrose ...	Lockrose and District Farmers' Progress Association	R. W. L. Raymont		
Longreach ...	Longreach Pastoral and Agricultural Society	A. Petersen ...	4 and 5 May	
Lowood ...	Lowood and Tarampa Pastoral and Agricultural Association	W. E. Michel ...	13 and 14 May	11 and 12 May
Mackay ..	Pioneer River Farmers and Graziers' Association	T. J. Leonard ...	23 and 24 June	
Mackay ..	The Pioneer River Farmers and Graziers' Show Association	T. J. Leonard ...	...	22 and 23 June
Macnade, <i>via</i> Lucinda	Macnade Farmers' Association	E. S. Waller ...		
Malanda ...	Millaa Millaa Settlers' Progress Association	S. S. Buckley ...		
Mapleton ...	Mapleton Fruitgrowers and Farmers' Progress Association	J. G. Smith ...		
Marburg ...	Marburg and District Agricultural and Industrial Association	A. H. Bielefeld ...	2 and 3 June	2 and 3 June
Mareeba ...	Mareeba District Mining, Pastoral, Agricultural, and Industrial Association	W. A. Ferguson ...	25 and 26 May	
Maryborough	Wide Bay and Burnett Pastoral and Agricultural Society	H. A. Jones ...	2, 3, and 4 June	1, 2, and 3 June
Miles ...	Miles District Agricultural and Pastoral Society	T. P. Goonan ...	...	21 April

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1914.	1915.
Minehan's Siding, <i>via</i> Townsville	Houghton River Farmers' Association	James Griffith ...		
Mitchell ...	Maranoa Pastoral, Agricultural, and Industrial Association	Neil Hammond ...	12 and 13 May	11 and 12 May
Mondure, <i>via</i> Wondai	Mondure Farmers and Dairymen's Association	G. E. Compagnoni		
Montville ...	Montville Fruitgrowers and Farmers' Progress Association	F. W. Thompson ...		
Mooloolah ...	Mooloolah and Glenview Farmers' Progress Association	William Ellison ...		
Mount Gravatt	Mount Gravatt and District Agricultural, Horticultural, and Industrial Society	J. H. Rackley ...	...	23 Oct.
Mount Larcom (Gladstone)	Wilmott Farmers' Progress Association	J. J. Kelly ...		
Mount Larcom	Mount Larcom Farmers' and Cane-growers' Association	Thomas Fraser ...		
Mt. Marshall, <i>via</i> Allora	Mount Marshall Farmers' Progress Association	J. Rooney ...		
Mullet Creek	Mullet Creek Farmers' Association ..	G. Lee ...		
Mundowran	Mundowran Pocket Farmers' Association	E. Canty ...		
Mundubbera	Mundubbera Farmers and Settlers' Progress Association	W. G. Parker ...		
Murgon ...	Murgon Branch of the Queensland Farmers' Union	W. D. Davidson ...		
Murray's Creek	Murray and Baffle Creek Progress and Farmers' Association	T. J. Gee ...		
Nambour ...	Maroochy Pastoral, Agricultural, Horticultural, and Industrial Society	A. H. Bushnell ...	8 and 9 July	21 and 22 July
Nambour ...	Bli Bli Farmers and Fruitgrowers' Progress Association	F. Pashen ...		
Nanango ...	Nanango Agricultural, Pastoral, and Mining Society	W. Selby ...	27 and 28 May	*
Nerang ...	Southern Queensland and Border Agricultural and Pastoral Association	E. Fass ...	...	30 Sept.
North Arm, N. C. Railway	North Arm Farmers' Progress Association	J. F. Fountain ...		
North Pine ...	The Pine Rivers Agricultural, Horticultural, and Industrial Association	G. W. Armstrong ...	25 and 26 June	25 and 26 June
Oakey ...	Oakey Agricultural and Pastoral Society	Alan B. Stanley ...	9 Sept.	
Oakey Creek, <i>via</i> Eumundi	Kenilworth Farmers' Association ...	Harry Pickering ...		
Okeden, <i>via</i> Wondai	Proston, Okeden, and Wigtoun Settlers' Association	R. McNamara ...		
Oman-ama ...	Redbank Farmers' Progress Association	W. K. Ison ...		
Palmwoods ...	Queensland Farmers' Union (Palmwoods Branch)	W. Browne ...		
Palmwoods ...	Palmwoods Progress and Fruit-growers' Association	Hugh McVair McKay		
Philpott ...	Philpott Creek Farmers' Progress Association	E. P. Earle ...		
Pickanjenie	Pickanjenie Farmers' Progress Association	J. Proud ...		
Pittsworth ...	Pittsworth Pastoral, Agricultural, and Horticultural Association	W. O. Hare ...	28 Jan.	27 Jan.
Pomona ...	Noosa Agricultural, Horticultural, and Industrial Society	A. H. Shears ...	4 and 5 Nov.	17 and 18 Nov.
Proserpine ...	Proserpine Farmers and Canegrowers' Association	W. B. Caswell ...	17 July	
Ravenshoe ...	Ravenshoe Farmers and Graziers' Progress Association	W. R. Soilleux ...		
Roche Creek, <i>via</i> Miles	Roche Creek Farmers' Progress Association	G. F. Smith ...		
Rockhampton	Alton Downs Farmers' Association...	G. T. Crook ...		

* Show abandoned

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1914.	1915.
Rockhampton	Rockhampton Agricultural Society...	H. Hill	18, 19, and 20 June	27, 28, and 29 May
Rockhampton	Jardine Farmers and Fruitgrowers' Progress Association	R. Lamain		
Rockhampton	Fitzroy Farmers' Progress Association	T. Ritchie		
Roma ...	Western Pastoral and Agricultural Association of Queensland	H. M. Campbell ...	19 and 20 May	20 and 21 July
Roma ...	Euthulla and Upper Bungil Farmers and Settlers' Association	John J. Maun		
Rosewood ...	Rosewood Agricultural and Horti- cultural Association	A J. Loveday	29 and 30 July	28 and 29 July
Sexton ...	Sexton Farmers and Settlers' Progress Association	W. K. Harvey		
Speedwell, <i>viâ</i> Stalworth	Speedwell Farmers' Progress Associa- tion	Aubray U. Potter		
Springsure ...	Springsure Pastoral and Agricultural Society	W. Fisher	13 and 14 May	12 and 13 May
St. George ...	Balonne Pastoral and Agricultural Association	Mark Roberts		
Stanthorpe ...	Stanthorpe Agricultural Society ...	A. E. Bateman ... ..	...	2, 3, and 4 Feb., 1916
Tabragalba ...	Tabragalba and Canungra Farmers' Progress Association	A R. Ludwig		
Takura, <i>viâ</i> Maryboro'	Takura Farmers' Union	S. E. Tooth		
Teutoberg ...	Teutoberg Farmers' Progress Asso- ciation	E. H. Ochmichen...		
The Caves, <i>viâ</i> Rock- hampton	Mount Etna Farmers and Selectors' Progress Association	Geo. Smith		
The Gums, <i>viâ</i> Tara	The Gums and Horse Creek Pastoral and Agricultural Association	S. E. Love		
Tolga ...	Tolga Forest Farmers' Union ...	H. Northey		1915.
Toowoomba...	Royal Agricultural Society of Queensland	G. Noble	21 to 23 April	13, 14, and 15 April
Toowoomba...	Toowoomba White Growers' Asso- ciation	A. C. Salmon		
Townsville ...	Townsville Pastoral, Agricultural, and Industrial Association	J. N. Parkes	14 and 15 July	29 and 30 June
Wallumbilla	Wallumbilla Farmers' Association ...	H. A. Watson		
Warwick ...	Eastern Downs Horticultural and Agricultural Association	F. H. Selke	10 to 12 Feb.	9, 10, 11, & 12 Feb.
Wellington Point	Wellington Point Agricultural, Horti- cultural, and Industrial Association	E. Ziegenfusz	4 July	
Wondai ...	Wondai Agricultural, Pastoral, and Industrial Society	H. J. Compagnoni	13 and 14 May	26 and 27 May
Wondalli, <i>viâ</i> Goondiwindi	Wondalli-Yelarbon Farmers' Pro- gress Association	L. C. G. Cameron		
Woodend ...	Warren-Woodend Farmers' Club ...	W. Lehfeld		
Woodford ...	Woodford Agricultural, Pastoral, and Industrial Society	G. H. Osmond	28 and 29 May	22 and 23 April
Woombye ...	North Coast Agricultural and Horti- cultural Society	E. E. McNall	10 and 11 June	23 and 24 June
Woombye ...	Woombye Fruitgrowers' and Pro- gress Association	J. Howe		
Woongarra ...	Woongarra Canegrowers and Far- mers' Union	H. A. Cattermull...		
Woowoonga Scrub	Woowoonga Farmers and Cane- growers' Association	Thos. Wilkins		
Yandina ...	Maroochy River Farmers' Union and Progress Association	D. G. Martin		
Yandina Creek <i>viâ</i> North Arm, N.C. Line	Yandina Creek Farmers and Settlers' Progress Association	J. D. Benfer		
Yingerbay ...	Yingerbay Dairymen and Farmers' Association	R. Frederick		
Zillmere ...	Zillmere Agricultural, Horticultural, and Industrial Society	Arthur B. Marquis	3 Oct.	18 Sept.

Departmental Announcements

The Editor will be glad to receive any papers of special merit which may be read at meetings of Agricultural and Pastoral Associations in Queensland, reserving, however, the right to decide whether their value and importance will justify their publication.

Secretaries of Associations are requested to be good enough to forward to the Editor, as early as possible, the dates of forthcoming Shows, as it is important in the interests of the Associations that these dates should be published.

It is equally necessary that prompt notice be given to the Editor of changes in the Secretaryship of any Society or Association, a matter which is much neglected. Furthermore, information concerning dates on which shows are to be held must be forwarded to the Editor at least six weeks before the Show date. If these suggestions are not complied with, the Society whose Secretary neglects to supply the required information will be liable to be struck off the list of Societies published monthly in the Journal.

To enable recipients of the *Queensland Agricultural Journal* to have the half-yearly volume bound, Covers in Boards and Cloth will be supplied from this Office on application to the Under Secretary for Agriculture. Applications must be accompanied by a remittance to cover cost. Covers will be supplied at ONE SHILLING and ONE SHILLING AND NINEPENCE each.

In order to avoid disappointment, correspondents who wish for replies to questions in the Journal are requested to note that it is imperative that all matter for publication on the first day of any month should reach the Editor by the 15th of the previous month.

Persons desiring to communicate with the Queensland Agricultural College and State Farms are requested to address their correspondence to the Principal of the College, Gatton, and to the Managers of the State Farms. The State Farms are: Hermitage (Warwick), Gindie (*viâ* Springsure), Warren (Stanwell), Bungeworgorai (Roma), Kairi (Tolga), Kamerunga State Nursery (Cairns).

We would ask our Subscribers to note that, when their Subscription has run out, a RED CROSS is placed against the Order Form. It often happens that this intimation is disregarded, with the result that the JOURNAL is NOT POSTED to the Subscriber. The Department cannot guarantee to supply back numbers in such cases.

It is notified, for the information of intending Visitors to the Queensland Agricultural College, that the Second Wednesday in each month has been set apart for the reception of Parties of Farmers and others desirous of inspecting the Institution. Supplies of hot water and milk can be obtained at the College, if desired.

The Department has now prepared a booklet on "Flower Gardening for Amateurs," which may be obtained on application to the Under Secretary for Agriculture and Stock. Price, TWO SHILLINGS.

PAMPHLETS on different subjects relating to Agriculture, Horticulture, and Stock are issued by the Department, and may be obtained gratis, on application to the Under Secretary.

NOTICE OF SHOW DATES.

We wish to draw the attention of Secretaries of Agricultural and Pastoral Societies and Associations to the importance of promptly notifying the Editor of any change in the dates on which shows are to be held.

QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

FOR SALE.

GRASS ROOTS.—Paspalum and Rhodes Grass at 2s. 6d. per sack, f.o.b., Gatton. JAPANESE MILLET SEED.—Price, 3d. per lb., or 25s. per cwt., f.o.b., Gatton. SOUDAN GRASS SEED, 4s. per lb., in small quantities not to exceed 2 lb. to any one purchaser.

Applicants will be supplied on receipt of remittance to the amount of the Order. There are no other Farm Seeds or Produce at present for Sale at the College.

POULTRY DEPARTMENT.

The College has for sale Poultry of the following breeds:—Brown Leghorn, White Leghorn, Silver-Grey Dorking, Indian Game, Plymouth Rock, Black Orpington, Buff Orpington, Silver-Laced Wyandotte, and White Wyandotte.

PRICES.

Cockerels, 10s., 15s., and 21s., f.o.b., Gatton.

Pairs—Cockerel and Pullet—30s. and 42s., f.o.b., Gatton.

Trios—Cockerel and Two Pullets—42s. and 63s., f.o.b., Gatton.

Prices vary, as above stated, according to quality. Additional charges of 2s. for a single bird and 1s. for each additional bird will be incurred by purchasers who fail to return crates promptly.

Eggs of the above breeds are offered for sale during the season, 1st July to 30th November. Price, 10s. per setting of twelve, f.o.b., Gatton. Nine eggs in each setting are guaranteed fertile. Should less than nine prove to be fertile, the infertiles will be replaced, if returned, carriage paid, and unbroken.

(N.B.—An infertile egg is uniformly translucent when held up to a strong light. Settings should be allowed to settle 24 hours before being placed under the hen.)

In cases where eggs cannot be sent otherwise than by parcel post, sixteen eggs will be sent to a setting, and no responsibility will be taken in connection with the replacing of any eggs which fail to hatch.

Applications for birds or eggs should be accompanied by remittance and addressed to the Principal, Agricultural College, Gatton.

The following Stud Animals are available for Service at the College Farm:—

AYRSHIRE—

Netherton King George, Imported. Sire: Netherton King Arthur. Dam: Midland Young Greenfield.

SHORTHORN BULL—

Bloomer of Darbalara. Sire: Emblem of Darbalara, 100 M.S.H.B. Dam: Lucy II., 1038 M.S.H.B.

Sows may be served also by imported Berkshire, British Large Black, and Yorkshire Pigs, at a charge of 5s. for each service.

Consequent on the numerous orders on hand for Pigs for forward delivery, it will be several months before there is any likelihood of fresh orders being filled.

A charge of **Two Shillings and Sixpence** will be made if Sows are left at the College for three weeks, for second service if required, for the keep of each animal.

Orders will be accepted after the 1st January, 1915, for **Berkshire and Yorkshire Boars**. It will, however, be some months before orders for Sows of either breed can be booked.

G. B. BROOKES, Acting Principal.

QUEENSLAND AGRICULTURAL COLLEGE.

The College, which is situated within 4 miles of Gatton and 1 mile from the College Railway Siding, comprises 1,692 acres, and the buildings can accommodate 60 Students.

TERMS.

Twenty-seven Pounds per annum, paid half-yearly in advance. Students are also charged **One Pound** per annum each for medical attendance, the sports fund, and for guarantee fee.

The course of instruction includes **Practical Agriculture** in all its branches, **Dairying, Gardening, Stock-Breeding, and Mechanical Arts.** Classes are also held daily for **Theoretical Instruction** in these branches, as well as in **Surveying, Chemistry, &c.**

The College Calendar, giving full particulars, may be obtained on application to the Principal at the College, or to the Under Secretary for Agriculture and Stock, Brisbane.

BURSARIES.

Four bursaries are given annually. An examination for these is held in December of each year. Bursaries will be awarded upon the following conditions:—Candidates (males) to be from fifteen to eighteen years of age, of sound constitution, and in good health; they must have resided in the State for the two years immediately preceding the time of their examination for such bursary; or their parents must have resided in the State three years immediately preceding such examination. The bursar is entitled—subject to good behaviour and the pleasure of Parliament—to free board and instruction as a resident student for a period of three years. He is required to take up his residence at the College within one month of the publication of the results of the examination; otherwise he forfeits his right to a bursary.

The **Age of Candidates** for Admission to the College as Students is **Fourteen Years.**

Full particulars and conditions on application to

The Under Secretary,
Department of Agriculture and Stock, Brisbane.

STATE FARM - - WARREN.

Stock for Sale.

YOUNG AYRSHIRE BULLS. Prices and particulars on application. Young **BERKSHIRE BOARS** and **SOWS.** Prices: Boars, £2 2s.; Sows, £1 1s. F.O.B., Warren. Crates returned.

Roots of the following Grasses for sale at 2s. 6d. per sack. F.O.B., Warren:—**Rhodes, Paspalum, Giant Couch.**

FOR SERVICE.—The Imported **Clydesdale Stallion, "Sir George."** Fee: £2 2s. per mare; and 1s. per week agistment. **Ayrshire Dairy Bull, "Naomi's Arthur."** Fee: 5s. per cow; and 6d. per week agistment. **Two Imported Berkshire Boars—**"Peterkin W." and "Flockmaster." Fee: 5s. per sow; and 1s. per week agistment.

THOS. JONES, Manager.

Department of Agriculture and Stock, Queensland.

“The Fruit Cases Act of 1912.”

Attention is drawn to the Regulations under this Act which come into force on the 1st June, 1915, and it is notified that on and after that date fruit that is sold in cases or is exported to any place within the Commonwealth must be in cases of the dimensions mentioned below. Bananas are excepted from the operations of the Queensland Act.

The sizes of the fruit cases required in New South Wales are of the same dimensions as those in the Queensland Act. The New South Wales Regulations are already in force.

Any case must be of one of the following **inside** measurements, clear of any divisions.

				LENGTH. inches.	DEPTH. inches.	WIDTH. inches.
(1)	1 bushel	..	..	18	14 $\frac{1}{4}$	8 $\frac{2}{3}$
(2)	do.	..	..	26	14 $\frac{1}{4}$	6
(3)	do.	..	..	20	10	11 $\frac{1}{8}$
(4)	$\frac{1}{2}$ bushel	..	..	18	7 $\frac{1}{8}$	8 $\frac{2}{3}$
(5)	do.	..	..	26	7 $\frac{1}{8}$	6
(6)	do.	..	..	18	5 $\frac{1}{4}$	11 $\frac{3}{4}$
(7)	$\frac{1}{4}$ bushel	..	..	13 $\frac{3}{4}$	4	10 $\frac{1}{8}$
(8)	Tropical Fruit Case (for Pineapples, etc.)			24 $\frac{3}{4}$	12	12

New or Clean Cases.

1. All cases for the Queensland trade must be new or clean and free from insect or fungus diseases.

2. New cases only must be used for fruit exported to any of the other Australian States.

3. New cases only must be used (under any circumstances) in the fruit districts of Stanthorpe and Bowen.

Case to show Maker's Name, Address, and Guarantee.

Every case, whether the fruit is for sale in Queensland or in another Australian State, must have legibly and durably on one end of the outside of the case:—

1. The name and address of the packer of the case.
2. The words “guaranteed by packer to contain 1 Imperial bushel” or as the size of the case may warrant.

In the case of the Tropical Fruit Case the guarantee should be—
“Guaranteed by maker to contain not less than 3,564 cubic inches.”

The above name, address, and guarantee should be at least 5 inches long and 2 inches wide; but stamps 3 inches by 1 $\frac{1}{2}$ inches and upwards will be accepted.

Exception.

The Act will not apply to the sale of fruit sold in trays, baskets, casks, or buckets, or to crates which contain trays of fruit. Fruit so packed, however, must have marked on the package the weight or number of its contents.

Contraventions.

Penalties are provided for persons who—

1. Pack fruit for the Queensland trade in disease-affected cases.
2. Export fruit to another Australian State in second-hand cases.
3. Obstruct or refuse to give information to an Inspector who is carrying out the Act.
4. Place an incorrect guarantee on a case.
5. Export fruit in a case carrying an incorrect guarantee.
6. Alter the size of a case bearing the packer's name, address, and guarantee.
7. Interfere with the packer's name, address, or guarantee on the case.

19th April, 1915.

ERNEST G. E. SCRIVEN,

Under Secretary.

ROMA STATE FARM, BUNGEWORGORAI.**SEEDS AVAILABLE.**

Teff Grass Seed, 1s. per lb.

Plants—Rhodes Grass

Feterita.

STATE FARM - KAIRI, N.Q.

FOR SALE.

Orders accepted for JERSEY and AYRSHIRE BULLS as at six months old; BERKSHIRE PIGS as at six weeks old; and BUFF ORPINGTON COCKERELS.

CONDITIONS: Stock to be paid for and delivery taken at the Farm.

Those desirous of obtaining Stock from this Farm should apply to the Manager, from whom all particulars can be obtained,

D. MACPHERSON *Manager.*

“QUEENSLAND GOVERNMENT MINING JOURNAL,”

PUBLISHED MONTHLY,

(Under the Authority of the Mines Department),

And contains the most Authentic Information pertaining to Mining Matters in Queensland.

Publishers: GORDON & GOTCH, Queen street, Brisbane, and 15 St. Bride street, Ludgate Circus, London, E.C.

Copies can likewise be obtained from Booksellers on the Mining Fields of the State and in the Australasian Capitals. Also, from the

QUEENSLAND GOVERNMENT OFFICE,
Marble Hall, 409-410 Strand, London, W.C.

I OFFER U

12 Packets of Choice Assorted Flower Seeds for 2/6. Post Free.

25 Packets, 5/-. 36 Packets, 7/-.

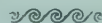
1 Packet of Australian Star Phlox (the Best in the World) for 6d.

1 Packet of Wallflower Seed, that will bloom anywhere in Queensland, for 6d.

Post Free.

All kinds suitable for planting in North Queensland.

Having 18 years' experience I can supply Vegetable Seeds most suitable for the North in 3d. and 6d. packets.



Orders for 5/- and upwards, Post Free; except Peas and Beans.

E. MANN, SEEDSMAN, **GILL STREET, CHARTERS TOWERS.**

BLACKLEG VACCINE.

DOUBLE VACCINE (powder form) for the PREVENTION of BLACKLEG is now prepared by the Department of Agriculture and Stock, and may be obtained in Tubes containing not less than Ten Doses, at a cost of 3s. per Ten Double Doses.

Full Instructions for Use are sent with the Vaccine.

Applications for same must be accompanied by Remittance, and addressed to:—

THE GOVERNMENT BACTERIOLOGIST,

STOCK EXPERIMENT STATION,

YEERONGPILLY,

NEAR BRISBANE.

